FURTHER EDUCATION

VOL. 2 NO. 2 SEPTEMBER—NOVEMBER 1950

Technical Education in Switzerland — SIR ARTHUR SMOUT
Advanced Courses in Electrical Engineering — PROFESSOR WILLIS JACKSON
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The Educated Illiterate
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FURTHER EDUCATION

VOL. 4 NO. 2 SEPTEMBER–NOVEMBER 1950

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ABOUT THIS NUMBER

THIS number is devoted almost entirely to Technical Education. It is hardly necessary to re-state how vital the development of technical education is to this country to-day. It would be easy to draw a depressing picture of present-day conditions. But surely the thing to do when the last available church hall has been commandeered to accommodate overflow classes is not to sit down and tell each other sad stories, but to tackle the problems with resolution. The articles in this issue give one the feeling that that is being done.

The articles "Planning a Technical College", "Some Problems of the Smaller Colleges" and "The Cambridgeshire Technical College" are all by college principals. They have a double value; they not only state the facts, they also show what some technical college principals think about the facts. This is important, for it can hardly be denied that technical college principals are among the most influential men in education at present and they are likely to be more so in the near future.

Has the article "The Educated Illiterate" anything to do with technical education? We think it has. It seemed to us startling in its quiet, matter-of-fact exposure of what is perhaps the greatest single weakness in the whole educational system. How young men can gain credits in English without acquiring an elementary ability to write English we do not pretend to understand. What is certain is that the sooner a thorough course in the usage of English is made compulsory in every technical college the better—there lies your humane study for the technical college.

In his article on Swiss technical education Sir Arthur Smout points out how much greater a part the technologist plays in public life there than in this country and one must agree with him that that is not unconnected with the greater attention paid to humanistic studies in the Swiss technical colleges. The study of English, properly pursued, can be as humanizing a study as any which can be invented.

ACKNOWLEDGEMENT

THE authors and the Association of Technical Institutes are thanked for permission to reprint in part papers delivered at the Association's Summer Meeting.

DESIGN SERIES

THE next article in this series, "Design in the Printing Industry", will appear in the December issue.

EDITORIAL

Technological Education

WHETHER the report of the National Advisory Council for Industry and Commerce will be in the hands of the public before this issue appears is a matter for conjecture. At the time of writing, advance copies have not yet reached the Press; but during the past five years some of the questions involved have already received an airing in official reports like the Percy and the Barlow Reports as well as in the Press, and indeed wherever two or three people interested in industrial education have been gathered together. So speculation will not beat its wings in a complete vacuum.

It is important no doubt in discussing such a complicated question to define one's terms. *The Times Educational Supplement*, in an editorial note introducing its series, "The Case for the Technical University", said an obvious course is to build "one or more independent institutes of technology, or technical universities as they are better called", which seems to indicate that when the word "technical" is coloured by the word "university" it becomes equivalent to "technology". The Advisory Council on Scientific Policy, under the chairmanship of Sir Henry Tizard, however, confined the term "technological education" to the training of those men who, having completed a full undergraduate course in a pure science such as physics or chemistry, proceed to a post-graduate course in a specialized branch of applied science. The annual output of such men is small, and the definition too narrow for the purposes of the National Advisory Council who are concerned with all those courses of study the completion of which leads to a first degree in a university or acceptance by major professional institutions as qualification for full membership. The National Advisory Council, therefore, can hardly be of the opinion that the training of technologists is a matter for the universities only.

This brings us straight away to one of the main points of debate: whether the answer to the problems of technological education is to be found in the establishment of one or more institutes of technology. It is difficult to avoid he feeling sometimes that the word "university" bedevils the argument. Professor Oliphant seemed to be aware of this when, in the *Universities Quarterly* of November last, he wrote:

"We should and must develop in Britain institutes of technology, universities of applied science, or whatever the susceptibilities of the engineers allow them to be called." The term "university" seems to be favoured chiefly because it implies freedom from direct Ministry of Education or local authority control. So long as the word is used and interpreted in that limited sense, discussion can proceed, but those other meanings of the term which Newman long ago examined keep cutting across the arguments. Therefore much ink and breath would be saved if it were agreed that the proposal put forward in many quarters is to establish one or more institutes of technology, it being understood that these institutes are to enjoy the same administrative freedom as the universities now have.

Who, besides Professor Oliphant, is of this opinion? Lord Cherwell is one of the most forthright advocates of this proposal. Anyone, he says, who has seen the enormous apparatus of instruction collected in the Massachusetts Institute of Technology, or in the similar institution at Zurich, must realize that this sort of training cannot be done on a small scale; it would be wasteful to assemble such a mass of equipment and such a numerous staff in order to deal with fewer than a thousand students; the huge American universities with 20,000 or 30,000 students can absorb great engineering departments with from 3,000 to 4,000 members without being thrown altogether out of balance, but to add an engineering faculty on the necessary scale to, say, Oxford or Edinburgh would be foolish, for either we should continue with a few score or perhaps a few hundred engineering students which would be extremely wasteful, or several thousand extra engineering students would stream in and the whole university would be thrown out of balance.

Some technical college principals are also in favour of establishing independent institutes of technology. Mr. H. Lowery of the South-West Essex Technical College, for example, has written in *The Times Educational Supplement*: "All considerations seem to point clearly to the urgent need for the immediate establishment of two, possibly three, new institutes of technology, or technological universities, having the highest possible educational status each accommodating 2,000 students." The majority of the technical college principals, however, do not seem to be of this opinion. The Association of Technical Institutions in its discussions has stressed the need for urgent action, and that in their opinion is more likely to be achieved by the development of technology in existing institutions.

The Times Educational Supplement took them to task on this matter

early this year, pointing out that in New South Wales a University of Technology had held its first classes in March, 1948, even though the Development Council responsible for it had not been appointed until August, 1947. Whether one or more institutions of that kind should be established in this country is at present being considered by the University Grants Committee. The National Advisory Council, being primarily concerned with developments in technical colleges, is keenly aware of the contribution the technical colleges are making to technological education in this country and is aware too—some may think unduly so—that the impact of institutes of technology upon the existing technical colleges might not be attended by the healthiest results.

Some idea of the relative parts played by universities and technical colleges in this country in training technologists may be had from the following figures for 1949:

Number of students reading for degrees in university faculties of applied science—10,884.

Number of full-time students in technical colleges attending courses above the level of the University Intermediate or Ordinary National Diploma Standard—6,116.

Part-time day students attending technological courses above the University Intermediate or Ordinary National Certificate Standard—12,332.

4,620 full-time and 4,157 part-time students were reading for university first degree.

It is not surprising, then, that technical college staffs are convinced that any plans for the development of technological education must be based on the idea that two systems of technological training have evolved in this country. They would go further and say that the two systems are not competitive but complementary—the university training is more closely related to fundamental science while the technical college training is more closely in touch with industry. On this line of argument it follows that the main problems for solution are how to expand and improve technological education in both technical colleges and universities. The establishment of an institution on the model of the Massachusetts Institute of Technology is regarded by many in the technical college world as supplementary and not as alternative to the plans that are now being made for an expansion of technological work in the present institutions.

At present the technical colleges train technologists chiefly by providing courses leading to London external degrees, Higher National Diploma (full-time) and the Higher National Certificate (part-time), but a few colleges also prepare students for the *internal* degree of their local universities. Few people, either in the technical colleges or outside them, are satisfied with these arrangements. The "London External" courses are too rigid in syllabus to allow the technical college that freedom of experiment which is necessary if it is to work closely with industry, while in the Higher National Certificate and Diploma courses the time available does not give enough training in fundamental sciences to satisfy the demands of industry today.

Various suggestions have been put forward to improve matters. Among the most important are:

(1) A further development of courses in various subjects at both the "first-degree" and post-graduate level with sufficient scientific foundation and sufficiently flexible to allow freedom for experiment on the part of the teacher and for research on the part of the students and staff.

(2) An improvement in staffing, equipment and accommodation which will enable colleges to develop these courses.

(3) The establishment of awards of high prestige to attract students to the courses and to meet their desire for a higher technological qualification.

(4) The establishment of a national body of high standing to be responsible for the quality of the courses leading to these awards.

There appears to be fairly general agreement about the first two of these suggestions, but there has been considerable conflict of opinion about the other two.

A fair measure of agreement seems to have been reached, however, on the following lines:

A new award should be instituted in technical colleges which would be of equivalent standard to a university degree but which would be more closely related to industrial practice than university degree courses usually are. Such an award would enable the technical colleges to plan their courses with greater freedom and flexibility; they would no longer be tied to the syllabus of the London External Degree courses.

A considerable number of technical colleges, both large and small,

are likely to provide such courses and therefore to ensure a high standard throughout the country. There should be established a national body with a high educational prestige in technology which would assess the standards of the courses and grant the awards. Such a body might be a Royal College of Technologists, consisting of elected Fellows, Members who had successfully completed an approved course of post-graduate study in technology, and Associates who had successfully completed an approved course of study at the "first-degree" level in technology. The college would not be a teaching body but would concern itself solely with the maintenance of high standards in these courses.

At the same time as these developments were being pushed forward, steps would be taken to expand and improve the technical colleges in accommodation, equipment and so on, and to ensure that in the matter of salaries and conditions of work technical college staffs were not at a disadvantage compared with teachers with similar responsibilities, as in the universities.

The third annual report of the Advisory Council on Scientific Policy issued in July hardly mentions the existing technical colleges in considering the future development of technological education. It suggests that as soon as the resources, material and human, can be employed without detriment to the work in applied science which is already being carried on in the universities, it would be prudent to establish one or more colleges of applied science with suitable governing bodies of their own but fitted into the university system. Professor Oliphant had some such system in mind when he contrasted the training of a doctor with the training of a technologist. "The earlier years of the medical course", he wrote, "which lay the scientific foundations for an art superimposed in the clinical years, are, or can be, of the same fundamental significance as other activities in a university. The clinical training which follows has always been carried out in a workshop, the hospital, and has played little part in true university activity." Why, he asks, should there not be similar institutions to provide the practical training of engineers and technologists? Why could a mining engineer not be given his instruction in mining in a "teaching" mine where the senior engineers were professors in a university? In Professor Oliphant's opinion, any applied sciences which remain in a university should become studies in the engineering sciences. Courses in sewage disposal and the tanning of leather, for example, should be replaced by a thorough training in modern mathematics, including the newer methods in

applied mathematics, modern physics in all its branches, chemistry and other subjects in which new discoveries are likely to impinge upon technology.

It is difficult to resist the feeling that there is a considerable amount of confusion in such arguments. What is "true university activity"? Professor Oliphant's functional definition of a university is "a corporate body of individuals whose aim is to preserve and continually review knowledge and culture gained in the past, and aggressively to attack and extend the frontiers of that knowledge". But can anyone deny that the greater part of an undergraduate's time in many subjects is spent in nothing more humanizing than just sheer cramming. Far from having any concern with attacking and extending the frontiers of human knowledge, he is often hard put to it sufficiently to extend the frontiers of his own. The medical student who is grinding away at the facts of Materia Medica is not reviewing knowledge of the past but is working at no higher a level than the school child who has been forced to learn a number of historical dates by heart, and the same is true of the student of English who has to learn the vowel changes which took place during the development of the Middle English dialect. Professor Oliphant, in short, is equating the work of the higher levels of the university with the whole work which takes place within its walls; we must look elsewhere for a sufficient reason for keeping the applied sciences outside the universities. He himself suggests such a reason: it is that the inclusion of the "clinical" aspects of practical engineering and applied science within the university inhibits the very substantial expenditure on these subjects which is essential to raise them to the levels demanded by our national economy.

The Advisory Council on Scientific Policy when last year it first advocated the establishment of separate institutions of technology did so as part of a long-term policy. The National Advisory Council is thinking in terms of immediate results. While it is possible that the National Advisory Council sees the problem perhaps too much from the technical college point of view, it appears to become daily more certain that the short term policy which this Council's report is likely to put forward will be forced upon this country by the sheer force of external events.

Sir Arthur Smout

TECHNICAL EDUCATION IN SWITZERLAND

(From a paper read at the Summer Meeting of the Association of Technical Institutions, June 19th, 1950.)

SWITZERLAND is no longer the playground of Europe; it is an industrial state. To the student of economics, it must present a most intriguing puzzle, for there is no country in Europe so unfavourably placed for industrial production; it has no natural advantages other than its water power and timber. It consumes only a fraction of its industrial products, e.g. 90 per cent. of its watches are sold overseas, and of the 10 per cent. sold at home, it is estimated that at least half are bought by visitors to the country. In addition the standard of living of the workers is high—wages compare very favourably with those paid in Britain, although, as one Swiss technician pointed out to me a few months ago, they cannot yet afford the luxury of a five-day week. Consequently, Swiss industry is "condemned" to high-quality production; it has to sell the excellent technical education of its people. If I were asked which is the more important to-day in British industry, raw materials or skilled labour, I should reply without hesitation, "Skilled labour." In former times our industries were perforce sited where the raw material lay, but this no longer holds good. The great cotton industry of Lancashire, the wool industry of Yorkshire, the non-ferrous metals industry of Birmingham, the motor industry of Coventry, the one thousand and one light industries in the London area are based on the fact, not that the raw materials on which those industries depend are on site, but that labour of the type essential is available freely.

Raw materials are abundant in the world markets; they can readily be moved from place to place cheaply and expeditiously; but of skilled labour there is a serious shortage. World-wide new industries to-day are attracted to a given district by the prospects of obtaining labour and especially skilled labour in that area.

It is not surprising, therefore, that every country is making strenuous efforts by technical education to maintain and improve that skill. Switzerland, having little to sell to the world other than

its skill, realizes perhaps more fully than any other nation the importance of technical education at all levels. Hence the value to Britain of studying the methods she employs and the facilities she enjoys.

It is pleasing, too, to find that over the years those responsible for raising the status of technical education in Switzerland have succeeded in inculcating into their students, to a surprising degree, the dignity of skilled labour, and in making it conscious of its responsibilities to the nation at large. They have succeeded, too, in making the Swiss workers realize the close relation between their own individual prosperity and their industry's competitive position. Further, the Swiss technical colleges and Technikums are ever conscious that they exist primarily to serve Swiss industry and its handmaiden, agriculture. Consequently, their relations with industry and commercial organizations, both large and small, are very close and of mutual advantage to both sides.

A stranger forms the opinion that they are part of the town and canton which they serve; everybody knows of them and their activities, and the director, or *rektor*, and his senior staff are powers in the land, whereas in this country our technical colleges are too frequently the Cinderellas of the educational system.

From these Swiss technical institutions come most of the leading executives of the larger firms, as well as the professors and lecturers. Industry seems to be closely integrated with the work of these colleges. Those responsible for the curricula do not hesitate to modify their teaching to fit in with the ever-changing pattern of industry and commerce, while industry is a generous contributor to the technical colleges, both in cash and in kind, and plays an important part in their counsels.

It brings to the technical colleges and Technikums many of its industrial problems and for this reason they devote a considerable proportion of their resources and efforts to scientific research—this is, of course, more especially true of the Federal Technical College at Zurich, but in a lesser degree is equally characteristic of Swiss technical education in general. Personally, I hold the view that our senior technical colleges and their staffs must be in a position to undertake more research work. Unless the heads of departments in our technical colleges are enabled to continue their research work, how can they hope to impart to their students that creative spirit which is so essential for success in the modern economic struggle? So many of our men are so engaged in "giving out" that they have no

time to absorb and discover fresh knowledge. Is it to be wondered at, therefore, that they rapidly become stale? In passing, it may be of interest to note that the West Midlands Regional Academic Board, of which body I have the honour to be Chairman, in its observations to the National Advisory Council on Education for Industry and Commerce on the subject of higher technological education, expressed the view that it is vitally important that the staff responsible for advanced work in technical education should be able to have both the facilities and the time for continuing with research work.

I would be so bold too as to state that in this country the members of the Association of Technical Institutions are not in a position to pursue in a disinterested and detached manner those aims, whose ethical and social significance can be compared with those of classical humanism, as their opposite numbers in Switzerland can, and indeed are encouraged, to do.

As a personal opinion, I express the view that much of the work at present being done in our trade research associations, under the general directive of the Department of Scientific and Industrial Research, could be done more economically and with greater advantage if it were done in our universities and technical colleges. Let the students see, as we saw in our younger days, their lecturers and tutors getting down to discovery, spending a considerable portion of their time "taking in" and not everlastingly "giving out".

In discussing this matter in Zurich recently, I was told quite naïvely that little Switzerland could not afford an expensive machine of the Department of Scientific and Industrial Research type, and had perforce to do its research in its existing colleges. Further, they doubted the wisdom of creating special institutions for work of this kind, isolated from the teaching colleges.

There is food for thought here, and although one is glad to see the Department of Scientific and Industrial Research placing more and more of its work with the universities, I think they are still not sufficiently aware of the need there is to extend this principle into our technical colleges, nor of the latent talent we have therein. Neither do they realize that by so doing they could make it so much easier for the technical college student to develop that creative spirit which I fear is lacking in so many.

One cannot think of Swiss technical education without being impressed by the different approach to a common problem in our two countries. We must, I feel, raise our "sights". Our ideals have wilted of recent years. We are so overcome with the difficulties of the

hour that we are in danger of missing the great purposes of life. While the function of our technical colleges is not the training of an élite by an élite, they have a greater task than merely to supply a sufficient number of trained hands to local crafts, industries, arts, and agriculture. They have a mission. They should be the centre of learning in their town and area, as the Swiss colleges undoubtedly are. It is their duty to prepare the way for a larger and more efficient industry, to induce a higher production, to enhance the prestige of the industries they serve, and to improve the skill of their labour, so that the quality of their products may steadily rise. They must supply that demand for that unwearied spirit of self-improvement which distinguishes so many of our technical students to-day as it did in the past. The products of our technical schools are insufficiently trained in the process of reasoning and of critical thought. Too frequently they are full of knowledge, but lack wisdom. Our men are well taught, but too often insufficiently educated. Much of this is due to the fact that they are trained on far too narrow a basis, and I have formed the impression that the Swiss method, with its insistence on certain non-technical courses, with its compulsory lectures on citizenship, turns out a more adaptable man, a better "all-rounder", than we do in this country. Many of them can converse freely in three languages, and they can present a case clearly and forcibly if needs be. They have a good appreciation of the commercial implications of a technical problem. They can write well, and many are potentially first-class administrators, which is not surprising, considering that superimposed upon the appropriate study is the opportunity, freely given and readily taken advantage of, of seeing administration in action. I find that the Swiss technologist of forty-five to fifty exercises much more influence on the social life of the community in which he finds himself than his British counterpart, and I suggest that much of this is due to his early training, with the breadth of vision which it inculcates.

A factor which contributes much of this breadth is the treatment of the teacher. As I have said earlier, one can only "give out" in proportion to what one "takes in", and the Swiss certainly give their teachers in technology far greater opportunities of "taking in" than we do in this country.

A considerable proportion of the teaching staff of the Swiss technical colleges have spent a number of years in industry—as, indeed, is true of this country too—but they seem to retain a closer contact with the industry from which they came than do our men;

they return to industry from time to time in order to keep abreast of changes in technique. I do not think we in England give the teachers in our technical colleges sufficient opportunity to keep up-to-date; they are compelled to devote too many hours to lecturing and teaching. So-called "summer courses" are all very well, but are we not in danger of overdoing this? Would not much of the time which the teacher is devoting to work of this nature be better given over to reading, research and attending "refresher" courses himself, in order that he may return to the class-room refreshed, reinvigorated and reinspired? I venture to suggest we in Britain do not educate our "educators" sufficiently. However well a man may be trained technically, however well qualified he may be, no training can retain its adequacy throughout any teacher's working life without constant adaptation to meet the accelerating progress of technical change. This lack of free and intimate intercourse between the teaching staffs of our technical colleges and the various branches of industry with which they are concerned is, in my opinion, the greatest weakness in the teaching of applied science in this country, and in marked contrast to the position in America and on the Continent of Europe, especially in Switzerland.

The question of "educating the educators" raises, I know, a serious problem. One can appreciate the natural reluctance on the part of a local education authority to grant leave of absence with pay for courses of this nature, but a much more liberal attitude is essential, and I think the regional boards and the National Council for Education have got to give the country a lead in this respect. Some scheme will have to be worked out which will enable teachers—especially senior teachers with the requisite experience in industry—to go back from time to time over their teaching life of, say, forty years, and refresh themselves, either by attendance at organized "refresher" courses, by direct return to the workshop itself, or preferably by a combination of both.

Our technical colleges must, I suggest, lean less on their respective local educational authorities and more on industry and commerce than they do to-day. The Swiss technical colleges, with their own boards of governors (and I use the word to cover not only the "technical high schools", but also the Technikums), while in a large measure financially dependent on the canton governments, enjoy a greater measure of rugged independence than many of our own colleges do; the relations between the authorities and the boards of governors seem to be based on mutual trust with complete liberty in

the discharge of their duties, subject only to their keeping within the overall budget of expenditure.

I thought I detected more "soul" and a greater community sense than in our own colleges, and certainly a greater spirit of liberalism on the part of the authorities.

This problem of how to give a "soul" to our colleges is a very real one to which all too little thought is given and all too little energy devoted. It is a plant necessarily of slow growth, but one of the greatest possible importance. I noticed a refreshing absence of "assessors", professional advisers, inspectors and "what-nots". The money thus saved seemed to be devoted to better staffing. In this connection, it is interesting to note that the ratio of full-time teachers to students at the Technical High School, Zurich, is one teacher for every seven students, and at the Technikum, Winterthur, where less research is undertaken, the ratio is one to fourteen. What a contrast to our British technical colleges!

The Swiss have their problems, some of which are of a special nature. I do not suggest that the Swiss methods should be imitated blindly in this country, but rather that the Swiss technical colleges are worthy of study since they supply a valuable stimulus to the methods of teaching most suitable to conditions in this country.

. . . . .

Switzerland is a confederation, consisting of twenty-five cantons and half-cantons, each of them being itself a small state. Each canton is responsible for the education of the youth in its area. As there is little or no federal control of education, the methods followed vary throughout the country. In the more industrial cantons—Zurich, for example—the general pattern is as follows.

Elementary education is compulsory. From the age of six to fourteen, every child has to go to school. After the age of twelve there are three different routes for further education, viz:

(*a*) The gymnasium, or, as we should call it, the grammar school.
(*b*) The secondary school.
(*c*) The higher elementary school.

From the gymnasium or from the secondary school the student enters one of the universities or polytechnics after having passed the "Matura" examination. Many of the secondary school students,

however, pass on to the commercial schools or enter a professional apprenticeship. The higher elementary schools are of a lower standard. Many of the students become unskilled workmen, whilst the more ambitious and more intelligent become apprenticed to the trade of their choice. During apprenticeship, attendance of the "professional school" on one or two half-days per week is compulsory for complementary training. The "professional school" is obliged to train every apprentice who has a contract of apprenticeship with an employer. The school has thus no possibility of choosing its pupils according to their abilities and can for this reason set no high standards. The teaching comprises, besides the professional subjects relevant to the apprentices' trade, commercial correspondence, bookkeeping, elements of economics and political science, arithmetic, and algebra. The aim of the "professional school" is to supplement the practical education of the workmen.

The young people who want to attend a Technikum must serve a three or four years' apprenticeship in industry before they enter a course of full-time study to fit them for higher positions in the career they have chosen. This course lasts three years and, owing to the period of apprenticeship and the compulsory year of military training, the average age of entry is twenty to twenty-one years.

The youth of the canton of Zurich who aspire to higher technological studies after having "served their time" as apprentices naturally turn to the Technikum at Winterthur: but there are sister schools at Burgdorf, Berne, Freiburg, Geneva, and Le Locle. Because, as I have already explained, each canton in Switzerland organizes the education of its own youth, each school differs slightly in character, but in their main features they follow a policy much in common.

The Technikum at Winterthur was founded some seventy-five years ago by the Government of the canton of Zurich as an ordinary technical school at which students leaving higher elementary schools at about fifteen years of age would receive two years' technical education. According to the Act of May 18th, 1873, its purpose was to train technicians of intermediate status and this aim was confirmed by the latest Ordinance of July, 1939. During the course of the years, however, developments have taken place which have led to the school's acquiring a unique position among the technical schools of the canton. Instead of entering direct from school, the students nowadays serve three or four years as apprentices in industry and then come to the Technikum to do three years' full-time study to fit

them for better positions in the career they have chosen, so that the average age at entrance is now twenty or twenty-one.

The only remaining link with primary education is that the standard of the entrance examination is that of the final year of the higher elementary school, the object of this examination being simply to weed out those candidates who would be hopelessly lost even in the first term's work.

This change in the age and attainments of the students, which was officially recognized some six years ago, is important. They are more grown up and possess a maturity based not only on their age, but also on their experience in the workshops and on military service. They return to their studies of their own free will, because they want to fit themselves for better positions than those to which they could hope to aspire as craftsmen; they come full of determination to work and to make the best use of their time. From this point of view, they are ideal student material. On the other hand, these circumstances present the teaching staff with difficulties, since the level of education of the entrants is extremely varied. This arises partly from the different standards of education prevailing in the several cantons from which the student population is drawn, and partly because of the different ways in which the years intervening between elementary school and the Technikums have been spent. In order to overcome these inequalities, the Technikum attaches particular value to close personal contact between teacher and student, amounting almost to a tutorial system. This in turns calls for, and receives, a generous staffing ratio.

As already mentioned, the Winterthur Technikum was founded to train the intermediate grades of technicians, and in this it differs markedly from the technical university, on the one hand, and the ordinary technical schools, on the other. The aim of the latter type of institution is to train craftsmen, while, in addition to essential technical knowledge, the university sets out to impart a scientific culture arising partly from the deeper and broader study of the basic science on which technology is built, and partly from the close association of its teaching with the advancement of knowledge through research.

The scope of the Technikum can perhaps best be illustrated by citing a few typical examples of the positions secured by its students. For instance, from the Department of Civil and Structural Engineering they become master-builders, clerks of works, officials in public works departments, architectural assistants, senior assistants in firms of public works contractors, and so on. Those leaving the

Department of Mechanical Engineering become shop superintendents, works engineers, power station superintendents, etc. In general, they are capable of carrying out in small firms those kinds of duties which larger concerns usually assign to graduate engineers from the technical university.

The school consists of six separate departments, namely, structural engineering, civil engineering, mechanical engineering, electrical engineering, chemistry, and commerce. Subject to the general authority of the Director, these vary greatly in function: even in the basic sciences, such as mathematics and physics, the courses are varied to suit the special requirements of each department. In all departments the curriculum covers three full years. As a general rule classes are kept small—thirty in the first year, and twenty in the second and third years—and in laboratory and drawing office even these small numbers are split up into groups wherever possible. This enables very close contact to be maintained between teachers and students, a feature of particular value when the capabilities and the previous education of the students vary so much. At the same time, it enables a much greater field to be covered in the limited time available than would be practicable with larger classes. One of the most important tasks is to teach the young students to think and work for themselves.

An interesting feature of the instruction at Winterthur is the insistence on certain non-technical courses. No attempt is made to impart general culture, but every student must take a language and literature course to ensure that he can express his ideas clearly and accurately. Again, it is realized that most if not all, students will later on work in supervisory grades in business concerns. Consequently, they all receive some instruction in methods of work organization appropriate to their profession, and in accountancy and bookkeeping. Further, practical expression is given to the belief that technically trained men later on exercise a considerable influence in the social life of the community by establishment of compulsory lectures in citizenship.

In all departments the instruction begins with the basic sciences, such as mathematics, applied mathematics, physics, chemistry, and so on, and then proceeds to the more technical subjects. In the practical teaching in drawing offices and laboratories, particular attention is given to preparing the students to deal with problems they will have to meet later on in their respective jobs. While stress is laid on the scientific background, without which an independent

approach is impossible, the object throughout is not to educate a scientist, but to train a practical man. Good use is made of visits outside the college to enable the students to see what they have studied in class and laboratories being applied in practice on building sites and in factories, etc.

Generally speaking, the Technikum aims at turning out an all-round man, and narrow specialization is avoided. Nevertheless, in several instances where sufficient demand arises from industry to warrant the formation of separate classes, the opportunity has been given to specialize, although it is realized that extra time given to one subject means less time for others. Thus, in the Department of Electrical Engineering, to meet the requirements of the rapidly expanding radio and telephone industry, a special course in telecommunication engineering has been established, while entrants to the School of Chemistry may choose to specialize in textile chemistry instead of taking the general course.

I have already mentioned the close relationship between the Technikum and Swiss industry. This relationship has right from the start been both happy and fruitful. On the one hand, the staff realize that, if they are to keep their students abreast of the continual advances in technology, they must take full advantage of contacts with the technical staff of the various industries in which these students will eventually be employed. On the other, the firms understand that the practical training of the students from whom they hope to recruit their own staffs requires first-hand experience with modern types of plant and machinery, and have always shown their appreciation of this fact by very generously providing the equipment required. Industry, too, provides the part-time lecturers, who deal with certain specialized topics.

The total income for 1948 of the Winterthur Technikum was just over £165,000, of which 77 per cent. was provided by the Government of the canton, 16 per cent. by the Federal Government, 0·9 per cent. by the City of Winterthur, and 4·8 per cent. by students' fees. The average cost per scholar that year was 2,872 francs (12 francs to £1).

This college caters for the whole-time student only. I have selected it as an example because I believe we in England will perforce be compelled to move more and more in this direction and establish in various regions throughout the country colleges of this type if we are to meet the pressing demand for technically trained men to run our industries.

Professor Willis Jackson

ADVANCED COURSES IN ELECTRICAL ENGINEERING

(Professor Willis Jackson, D.Sc., M.I.E.E., is Professor of Electrical Engineering at the Imperial College of Science and Technology. This paper was delivered at the Summer Meeting of the Association of Technical Institutes, June 9th, 1940.)

WHAT I consider to be most needed—in the electrical engineering field at any rate—is a clearer indication than we have yet had of what industry wants by way of courses of post-graduate and post-National Certificate standard, and also of its willingness to release suitably chosen graduates and National Certificate men for periods of up to a year for further study.

As I see it, industry has not formed or expressed its views on this matter and perhaps, because of its diversity, it cannot readily do so, which means that we in educational work must take the initiative—as in fact both the technical colleges and some universities are now doing—and must make provision in the hope that industry will in fact co-operate in a vigorous manner.

The task of making adequate provision for post-graduate, post-National Certificate study is a joint responsibility of the industry, the technical colleges and the universities.

I do not propose to attempt a precise statement of the desirable respective contributions of these three partners but it is my conviction that the part to be played by the technical college is likely to be, and should be, a much larger one than that by the universities in respect both of the number and range of courses to be provided and the number of students to be dealt with.

There are certain aspects of the problem which it seems to me are essentially a technical college responsibility, whereas the contribution which I visualize as a desirable and proper university one may well, under more favourable circumstances than exist at present, come to be supplemented in similar form by a limited number of technical colleges.

Need for Post-graduate, Post-National Certificate Courses

The need for an extension of the provision for technological education (in the electrical engineering field) beyond the present undergraduate and Higher National Certificate stages is a natural consequence of the following facts:

(1) The practice of electrical engineering is subdividing itself into an increasing range of specialist branches, the techniques of which cannot be more than touched upon, if they can or should be mentioned at all, during the undergraduate and National Certificate periods, and furthermore, rapid technical development is occurring in most of these branches.

(2) The basic scientific knowledge in physics, chemistry and metallurgy underlying, in various degrees, these technical developments, is also growing rapidly, and this applies further to the analytical (mathematical) tools available for the solution of technical problems.

(3) The ability of students to absorb and assimilate new ideas and information is not growing at a corresponding rate, which means that an increasing amount of relevant matter, both technical and scientific, is accumulating for attention outside the accepted periods of undergraduate and National Certificate study.

In the past the acquisition of this supplementary knowledge was left very largely to individual initiative, but it is now evident that this arrangement will no longer suffice, and that steps must be taken to ensure a wider dissemination and more rapid utilization of the knowledge and experience available by the organization of appropriate advanced courses. In doing so, we shall be wise to recognize, however, that the previous arrangement was not wholly lacking in merit.

While it is true that however able a student and whatever the stage at which he approaches a new subject, he will benefit from a presentation of the essential features of it and from a co-ordination of the knowledge in that subject with knowledge and information in related subjects, this is only the first part of the job. We shall in fact achieve very little if the courses provided do nothing more than hand out information.

In the absence of considerable personal initiative and prolonged self-sustained effort by the student, no amount of attendance at formal lectures will ensure real understanding of the information supplied or facility with its application to new and difficult problems.

The real purpose of such courses as are provided must be to stimulate discussion and to guide subsequent personal effort by the student, and their real value will be governed by the extent to which this is achieved.

Before proceeding to a statement of the nature of the requirements as I see them, I would like to make the point that in emphasizing the need for an extension of study beyond the present stages of degree and Higher National Certificate award, I am not suggesting that the present durations of undergraduate and National Certificate study should be increased.

As far as the universities are concerned I feel that 3 years beyond Intermediate is a long enough period before a prospective engineer makes his first prolonged contact with the practice of engineering and I will leave others to suggest that the present period of National Certificate study gives a man a recognizable qualification at an undesirably early stage.

There have been suggestions that we should bring our undergraduate courses into line in duration with those on the Continent and in America. What is usually ignored in these suggestions is that the standards of entry to what are called undergraduate courses vary considerably. In America, for example, and citing the Massachusetts Institute of Technology as a particularly good case for comparison, the standard of attainment in the basic subjects of physics, chemistry and mathematics at the end of the second of their four-year undergraduate course in Electrical Engineering, is little if any in advance of our Higher School Certificate or Intermediate standard, and the overall standard of first degree award is correspondingly not higher than that of our ordinary degree, although it may be more advanced in particular topics because of the greater specialization permitted.

An honours degree student in this country is therefore to be compared with an M.S. degree candidate at M.I.T. and he is undoubtedly a more broadly and soundly informed person scientifically and technically than the M.S. degree men of most American colleges.

The position is rather different in the larger colleges on the Continent where the college course goes beyond our undergraduate courses in providing for a greater measure of specialization in the later stages and seeks within the specialized branches to afford a form of experience which we regard as better provided in our schemes of post-graduate industrial apprenticeship.

I do not know which is cause and which is effect, but the fact is

that no other country to my knowledge has developed a system of post-graduate apprenticeship training in electrical engineering comparable in overall standard with that organized by the electrical industry in this country. The duration of post-graduate industrial training on the Continent before attachment to specific appointments is of the order of six to nine months. In America such companies as General Electric and Westinghouse have schemes of training of two to three years' duration following the same general lines of the Metropolitan Vickers and British Thomas Houston Co. schemes, for example, but the G.E. scheme caters for only a small proportion of their graduate recruits (whereas the M.V. and B.T.H. ones cater for all), and the remainder receive little or no systematic training.

It is for this reason, among others, that we in electrical engineering are not particularly impressed by the statements which have been made to our detriment about the technological superiority at professional level of the products of other countries. This does not mean that we are doing all we ought on the technological side—let alone on the humanistic one—and that we have not something to learn in both respects from other countries. But it does mean that as far as our professional product is concerned there is little occasion to advertise our deficiencies to the world, as has been done for us by others during the past few years, to the likely detriment of our technical and economic standing.

I shall suppose on the university side, therefore, that the undergraduate arrangements will continue as at present, and that it will remain the practice for graduates of electrical engineering to follow a subsequent course of industrial apprenticeship of two years' duration.

Types of Course to be Provided

What the graduate requires on entering industry are courses which assist him to obtain a sound knowledge of engineering practice and of industrial organization, and to appreciate how and why, on economic as well as technical grounds, the existing practice and organization has emerged and what are the directions along which improvement is required and might most profitably be sought.

In this connection it is important to recognize that the up-to-date knowledge of this practice is to be found in industry, or in analogous organizations, and not in general in any educational institution of itself. The functions of the latter at this stage are to afford an environment in which the men in industry who possess the knowledge,

and can impart it, may meet those who wish to acquire this knowledge; to ensure satisfactory co-ordination where a range of lecturers may be dealing with related practice, and to provide for any necessary associated theoretical work.

Depending on the character of the local industrial activity, the desirable content of the courses will vary from one area to another, and, since the prospective students will be in employment, the most appropriate means of meeting this requirement will usually be through locally organized part-time courses. It may sometimes be desirable, in addition, to organize continuous courses of a few days' duration, or longer, to which men may be attracted from the country as a whole. In some such cases, the research interests of a particular university may make it an appropriate organizing agency, but in general, in my opinion, these kinds of provision are essentially a technical college responsibility.

I am, of course, aware that a wide range of courses has already been provided for the benefit of graduates and National Certificate holders in various centres. I have in mind particularly the scheme of Post Advanced Courses introduced in Manchester a few years before the late war under the auspices of the Regional Advisory Committee and in the organization of which the senior professional engineering institutions and industry co-operate. This scheme is now in operation again, and there is one interesting feature of it which is worth copying. It is that of associating with each course an organizing lecturer with the special responsibility of ensuring that the contributions of the several lecturers, if there are more than one, are fully co-ordinated.

Notwithstanding the value of what has been done, however, there are, in the electrical engineering field, many gaps to be filled, and with a view to obtaining an assessment of the position the Council of the Institution of Electrical Engineers set up a number of specialist panels to deal with telecommunications, measurements and electrical machines. Each of these panels has prepared detailed syllabuses of a number of lecture courses for which it considers there is a special need, and it is hoped that these courses will be provided in a number of centres in the country.

The panels drew special attention to the need for an integration of economic as well as technical considerations in the treatment of the respective subjects. In other words, they stressed that it was not sufficient merely to discuss their theoretical and technical aspects but that the lectures should afford a critical appraisal of the relevant

manufacturing and operating features, with a view to ensuring a balanced appreciation of the relative merits and demerits of alternative procedures.

I might perhaps illustrate this by one of the subjects, that of modulation in connection with radio communication. Several techniques of modulation are available and in use—namely, amplitude modulation, frequency modulation, phase modulation and various forms of pulse modulation.

A theoretical treatment of some, at any rate, of these methods forms an integral part of all undergraduate courses and many National Certificate courses in electrical engineering, but it is not possible because of time, and indeed it would not be very desirable or profitable at this stage, to make a critical appraisal of the relative suitability of these different methods on technical and economic grounds for particular spheres of application. Yet this is just the kind of appraisal required by a young man in industry who is in process of being trained to carry, or is carrying, a measure of responsibility for technical decisions—and it is one which is difficult to acquire without substantial assistance from more senior and more experienced members of the profession, and not necessarily only those employed in the same organization as himself.

What I have said so far relates to men whose concern is to be with the problems of design, manufacture and operation rather than with development, particularly long-term development, and research. The latter comprise a much smaller, but a very important group.

These men have the difficult task of keeping up to date with the trends of scientific progress from which the new possibilities of technical development will emerge, and it is likely that after a few years in industry they will benefit by a return to an educational institution for the purpose of strengthening their scientific and analytical knowledge in relation to the particular aspect of engineering work in which they have taken a special interest.

My grounds for saying this—and at the moment the argument has a much stronger justification in relation to the universities than the technical colleges—is that the type of knowledge they will wish to acquire will demand much more continuous and prolonged attention than can be afforded by part-time courses, and that the men most able to assist are to be found in the universities.

There are in the universities groups of physicists, chemists, metallurgists and mathematicians, who, though not directly concerned with the progress of electrical engineering as such, are available to

assist their electrical engineering colleagues in bringing suitably chosen students to the frontiers of scientific and analytical knowledge relevant to new possibilities of electrical engineering development. Advantage could, and should, also be taken of the special knowledge possessed by appropriate industrial scientists and engineers. So it should be possible to build up quite rapidly a limited number of full-time sessional courses of very high standard.

I mentioned previously that I am not in agreement with much that has been said to our detriment with reference to the educational arrangements of other countries. But on this particular matter there is no doubt we have something to learn from the arrangements at the Massachusetts Institute of Technology.

Courses, of very high standard in both the analytical and experimental sense, are available at M.I.T. in several branches of electrical science and technology. A particular feature is the close inter-relationship of the advanced teaching with research, a consequence of the fact that extensive research activity exists in each of the branches of electrical engineering in which a post-graduate course is provided, and steps are taken to ensure that the students are brought into regular and intimate contact with this research work.

Moreover, and this is no less important, the research work in electrical engineering is co-ordinated with that in the mathematics, physics and chemistry departments to a degree which goes far beyond what has been attained in this country. Thus the electronics and electro-acoustics sub-sections of the electrical engineering department are operated jointly by staff members of the electrical and physics departments, and the materials sub-section jointly by the electrical and chemistry departments.

I consider it essential that analogous conditions be aimed at in any attempt to build up full-time post-graduate courses in this country. In other words long-period post-graduate courses should be provided only in centres where there exists, or can be built up, an active research group in the subject in question—and as a necessity for successful progress of this research, close association with research workers in the related sciences.

Attendance at the M.I.T. courses I have mentioned, and success in an examination based on them, constitutes part of the requirement for attainment of the Ph.D. degree. In this respect the basis of their Ph.D. award seems to me more sensible than our own.

They are also fortunate compared with ourselves in that there is a much greater willingness on the part of industry than has yet become

evident in this country to send suitable young men back to the university for appropriate advanced study. As I consider it essential that we should make a similar provision, it seems likely therefore that the men in attendance at our courses for some time to come may have less preliminary industrial experience than I personally consider desirable.

In conclusion, I would like to say that the full development of the two forms of courses mentioned will demand the closest possible collaboration between industry and Government establishments, the larger technical colleges and the universities, with an obligation on the two former not only to assist with the provision of lecturers but also to release for short or long periods of further study, as the case may be, the appropriate members of their junior staff. It will demand also a considerable increase in financial allocation to such educational institutions as are to play a special part in this activity.

Granted these conditions, I am sure that, without copying anyone abroad, we can perform this important educational task in a manner which will more than bear comparison with the achievements of other countries—and it is well we should do so, and quickly, not only for the direct benefit to industry which would result but also for the indirect benefit which would accrue from attracting to this country more high grade students from abroad. The schemes of post-graduate and other forms of apprenticeship training which are now operating throughout the electrical industry are more fully developed than those of any other country. To match and marry them with an effective scheme of post-graduate, post-National Certificate courses is a matter of the greatest urgency.

W. A. J. Chapman

PLANNING A TECHNICAL COLLEGE

WORK on the new technical college being built at Hatfield by the Hertfordshire County Council began in the latter half of 1948, and it is hoped that in some of the departments at least teaching will begin about the end of next year. There are several interesting and unusual circumstances in the "pre-history" of this college. The chief of these are:

(1) The College and a Technical Secondary School adjoining are being built on a 90-acre site given to the County Council by Mr. A. S. Butler, Chairman of the De Havilland Aircraft Co. Ltd. whose main works are at Hatfield.

(2) Shortly after the outline plans and accommodation had been approved and foundations started, a Principal was appointed, his duties being to plan and equip the College, develop suitable contacts and advise the authority on questions concerning technical education generally.

(3) The area to be served by the College is almost virgin territory as far as senior and advanced public technical education is concerned. In the immediate neighbourhood, the De Havilland Company, in conjunction with the local authority, administers a works school for their apprentices. The academic work there will eventually be handed over to the College. Apart from this school, what facilities there are have only been developed fairly recently[1] and most senior and advanced students travel to London (twenty to twenty-five miles) for classes. (At present about 3,000 students from the area travel to institutes in the Greater London area.)

(4) The skeleton of the building is of a bolted-up frame rather similar to that employed for steel-framed buildings but with pre-cast reinforced concrete columns and pre-stressed trusses instead of the stanchions and joists normally employed in steel construction. This rather novel form of construction confers a greater degree of permanence than is generally associated with pre-cast buildings, and at the same time lends itself to rapid construction and the saving of many tons of steel.

[1] See Mr. Vaughan Thomas' article on p. 160.

The idea of a technical college and a technical secondary school on the same site, with joint usage of playing field facilities and with their respective heads living as neighbours in houses to be erected on the site, is interesting and full of possibilities. It is hoped that the arrangement will result in the work of the school developing along lines of an ideal character and that the eventual outcome will be to the advantage of both institutions and of both forms of education. The relationship will certainly encourage the school to develop sixth-form work and the College should benefit by a regular intake of suitable material to maintain its advanced academic studies. Another useful prospect, under harmonious relationships, might be some interchange in the use of laboratory and other facilities, a principle already laid down in connection with the provision of three gymnasia for use by the two institutions.

The College will have a capacity of 800-900 students in departments of engineering, building, commerce, pure science, domestic science, and social studies. Aeronautical engineering will naturally be most in demand, but the catchment area includes pockets of mechanical, electrical, radio and production engineering, and work in all these fields will be carried to Higher National Certificate level. The development of the new towns of Hatfield and Welwyn Garden City is certain to result in more light engineering entering the area, and for such increases an adequate service will be available in conjunction with the development plans of the authority.

For building work the College will provide senior and advanced facilities for a large, scattered area including the towns of Hatfield, St. Albans, Welwyn Garden City, Hertford, the northern Barnet areas, and various smaller localities. Workshops are included for all the chief crafts. At present contacts and goodwill are being built up among local industrial organizations.

There are in the area strong and enlightened demands for classes in chemistry and pure science, and representatives of the industries concerned have already stated what they want in fairly specific terms with the result that arrangements have been made for classes in these subjects up to an advanced level. The different reactions of various industries in this preliminary phase have been interesting. The highly developed technical and research industries are quite clear as to their requirements and state them in very concise terms. One has the impression that when facilities are available a well-organized set of students will be forthcoming and that systematic progress will be ensured. On the other hand, with an industry such

as, say, the building industry, whose requests are no less fervent, one feels that the industry needs from the College something more than the mere technical training of its youth and that the College should use its influence towards an improvement in social and educational discipline. No doubt this outlook applies to other industries where operatives are scattered in small, loosely disciplined units of two or three as opposed to those where a large number are assembled together with all the facilities for service, supervision and control.

As a centre for cultural and social studies and for public and county functions the College is likely to become important. Situated as it will be with the new town of Hatfield on one side, open country on the other, within twenty miles of London, near the geographical centre of the county, adjacent to N.-S. and E.-W. trunk roads and near a focal point of about seven bus services, it will be readily accessible from all sides. The site, which is roughly triangular, has a frontage of about half a mile on the A555 Barnet By-pass, and is about half a mile deep so that there is ample space for the subsequent provision of hostels, and for the later development of its social capabilities.

Under the circumstances prevailing, the provision of facilities and the design and layout of the building presented both easy and difficult problems. Usually a new college is built to take over established work; here there was little or no precedent except for the work being done at the De Havilland school. Some assessment was possible from an analysis of those travelling to London for classes, and from the potential students according to the classification of industry in the catchment area. Future demands that might arise from the new towns of Hatfield and Welwyn Garden City could only be estimated. The difficulty of having no precedent or tradition was offset, however, by the freedom offered in planning. We drew upon established practice, combined the result with the unorthodox, and tried in the final result to provide the best of both.

As mentioned above, the construction of the building is unusual. The accommodation is provided by a combination of single- and double-story units, arranged to fit in with a slope of about one in thirty on the site (lowest level at front fortunately). Thus as a frontage the assembly hall is over the dining-hall, library over entrance hall, administration, staff, and common rooms over the students' service and cloak-rooms. Immediately behind this is a two-story block containing the science over the domestic science units. The remainder

consisting of class-rooms, workshops and laboratories, drawing offices, staff rooms, gymnasia and service-rooms, are all at ground-floor level. The ground in the immediate neighbourhood of the building is to be on two or three levels, with low retaining walls on account of the slope. This should add to the appearance of the building when completed, as it has given the architects an opportunity to plan lawns and gardens at varying levels.

In planning the accommodation the aim has been to provide for efficient working with maximum economy in space and, judged by some standards, the rooms may appear small. Most of the class-rooms are 510 sq. ft., and will hold twenty-four students. There are also a few rooms of 770 and 640 sq. ft. The engineering and building workshops are 1,425 sq. ft. and 1,200 sq. ft. respectively. Two sizes of laboratory are provided—1,100 sq. ft. or 800 sq. ft. Adjacent to the carpentry and brickwork shops is a concrete space about 75 ft. by 60 ft., which will be used for the outside erection of buildings, drain-laying, and so on.

The storage space should be well up to modern ideas and requirements. With few exceptions, every room (class-rooms included) has its own store. In addition, for the class-rooms and drawing offices, a fixed blackboard-cupboard unit has been designed which, in conjunction with the store, will make loose cupboards unnecessary and allow full use of the floor space. Visual aid work is provided for by sash-type blackboards which when raised allow for projection on to a screen behind; dark blinds are fitted to windows facing south. For adult and discussion classes, a number of class-rooms are being furnished with semi-reclining chairs.

During the planning of rooms and equipment it was found that sometimes there were well-defined principles which could be followed; at other times a certain amount of inventiveness was called for. The aircraft structures laboratory, for example, presented some interesting problems. Some help was to be had from existing departments of the kind, but the main problem here was one of size. Finally, by scaling down each item of equipment to fit the size of the room, a useful collection of test frames, loading gantry, and so on was assembled. In the retail trades room we have tried to produce a room which can be used for class demonstration, as a shop, or for practical individual work. As part of its demonstration equipment, it has a 10-ft. shop window with another 5-ft. window on the side giving on to a main corridor.

The operation of many schools and colleges is reduced in effective-

ness by apparently trivial circumstances or shortages, and an effort has been made to avoid this as far as possible. The writer has never yet worked in a college possessing sufficient private working rooms for its staff, who were forced to use some odd corner of a store or the common room. So working staff rooms accommodating from four to six have been incorporated at strategic points and should be of great value. For similar reasons, a students' private study room has been provided and should be of value to those who have few facilities for study. If the corporate activities of students are worth encouragement, their officials should be comfortably housed in their own offices, and we consider that such a room is an essential part of the accommodation. A small dining-room is provided for the non-teaching staff, who so often have had to dine with students, take their meal in the kitchen, or have it amidst the debris of the main college meal.

Mention has been made earlier as to the anticipated use of the building for regional functions and for its application to the wider aspects of further education. These requirements have been kept in mind in the planning of its general amenities. The main assembly hall of 4,000 sq. ft. is planned to seat 750, but because a college hall is so often used for functions with an audience of not more than 200 to 300, and to avoid the unfavourable psychological effect on a small, intimate audience of a large empty space behind, the rear half of the hall may be closed off by a movable screen. The stage, measuring 55 ft. wide by 28 ft. deep, has a 33-ft. proscenium and cyclorama with sufficient back height to fly scenery. Three dressing-rooms behind the stage may be used for stage service or adapted as music rooms for teaching purposes.

Alongside the main hall, and half its area, is an exhibition hall, approached through doors either from the main hall or from the entrance hall. This has separate access to the stage, and its possibilities should not need further elaboration.

The main dining-room, below the hall, is arranged to provide a sitting of 300 on a self-service basis with a staff bay (with service) accommodating forty-eight. A separate cafeteria has been provided to avoid dislocation of the main kitchen arrangements by the service of refreshments at irregular times. A pleasing feature of the dining-room is that its long, low windows give on to an outside terrace to which doors give access.

A good deal of thought has been given to the library, which is situated near entrance halls and assembly hall. Here the object has

been to create a library which will attract the most rough and humble student. Situated rather above the upper floor level on the two-story frontage it will have low windows with south and west aspects. As the building is set high, the west windows command a fine panorama of open and unspoiled country with the Abbey of St. Albans, five miles away, dominating the horizon. The interior furnishing of the room is designed so as to combine the usual dignity of a library with a certain degree of informality. The library has an area of about 2,300 sq. ft., and a capacity of approximately 10,000 volumes.

The siting of a large, tiered lecture theatre proved to be a difficulty for some time, but it was eventually solved by a happy inspiration on the part of the architects, who produced a room with all the necessary appendages, seating 100. It was considered that such a room should form part of the general public amenities but at the same time it should be readily accessible for science and engineering students. It was therefore placed so as to be easily accessible from both the main entrance, and the science and engineering departments.

There is no doubt that important as may be the problem of providing suitable facilities for full-time compulsory education, that of catering for further education on a voluntary basis is even greater if we are to bring in that large proportion of our population as yet untouched. No amount of organization or expenditure will bring these people into a building which they do not like. The national importance of the work, both from the social and the economic aspect, is unquestioned. The 1944 Act provided the incentive, and *Further Education* gave us the vision, but progress must necessarily be slow where social habits are involved.

We in Hertfordshire hope and believe that in this building will be incorporated all the features necessary for it to serve its purpose effectively, and our aim here will be to work towards a happy combination of educational dignity and social friendliness.

D. J. Williams

SOME PROBLEMS OF THE SMALLER COLLEGES

Two world wars were required to convince this country that technical education suffered more than its fair share of neglect during the first half of the century. The ensuing peace and economic strain have made it clear that further neglect could be a vital factor in determining the issue of the inevitable conflict ahead, whether it be military, merely economic, or both. Even in the event of the drastic curtailment of public expenditure on social services, the people concerned with technical education must still anticipate a rapid acceleration of the expansion which started in earnest during the early years of the war, because expenditure on technical education, if any such justification be required, can justly be described as expenditure on defence. We must be ready, therefore, to profit from the experience we have gained through the years when we have been making very little go a long way and especially from the errors we made while doing so. It may, therefore, be worth our while dwelling upon some of the problems which have faced us in the last few years, some of them common to all colleges, but most of them affecting the smaller colleges in a special way.

The Association of Principals of Technical Institutions recognizes more than two hundred colleges, not including independent Colleges of Art. The Ministry of Education describes an even larger number as "Major Establishments of Further Education". These vary in size and scope from the great London Polytechnics, the unique Loughborough College and the City Colleges such as those of Birmingham, Manchester and Liverpool to the isolated establishments such as Barrow, Wrexham and Exeter. The bulk of the advanced work is carried by thirty or, perhaps, forty large ones, but the greater load of technical studies is still distributed between the one hundred and eighty or more intermediate and small colleges. For instance, if we consider the north-western area, one which has a fairly large proportion of large colleges, we find that one-third of the bulk of work is done by the four largest establishments, namely six millions of student hours, while the remaining twelve million student hours are shared between twenty-eight other colleges. These figures represent

an increase of about one hundred per cent. in ten years, all achieved with a very modest amount of new building but at the cost of a tremendous expenditure of physical and nervous energy devoted very largely to the non-educational processes of securing, equipping and administering improvised premises, often most inconveniently sited, and falling far below even pre-war standards in hygienic and social amenities.

Accommodation

There is no doubt that the over-riding problem facing all colleges, even comparatively new ones, is that of providing further accommodation. The need in the smaller colleges is, in many cases, proportionately greater than in the large ones for expansion has affected them in a different way. Great industries have sprung up unexpectedly in small places; in some colleges the pressure has increased not only through the normal expansion of their customary work but also through the unloading upon them of lower grade work by the larger colleges in their efforts to cope with additional advanced training; finally, a rather greater proportion of the new day release work, especially the craft training, falls in the early stages upon the smaller colleges.

Some of the latter were never above criticism on the score of quality of buildings and amenities. Many were conducted in converted day schools, long condemned; in some of them, used as they are to their full capacity, morning, noon and night, there still lingers that characteristic atmosphere not entirely due to the presence of laboratories and workshops but suggesting also, it is to be feared, wet clothes and second hand air. Small wonder that staffs working in such buildings feel bitter when they see photographs of the glass palaces built as trade schools and technical colleges in Holland, Switzerland and Germany between the wars. They wonder why the best this country could do in the nineteen-thirties, when building costs were low, was to keep unemployed builders alive on insurance benefits.

Now that the country is willing, nay anxious, to give us glass palaces even before the demand for workmen's houses and infant schools is wholly satisfied, the materials and labour are almost unobtainable and the cost hardly bears thinking about. Nevertheless, we must think about it, and with something of the urgency we devote to other defence problems. The Ministry programme costing £5,000,000 in 1949 was a step in the right direction but only in very

few areas will it, as the Ministry suggests in its annual report, "not only keep pace with increasing demand" but also "do something to reduce overcrowding". It was hardly the stirring sort of programme which conveys a sense of real urgency. Unfortunately, the finances of Local Authorities are involved as well as those of the Government and, where the responsibility for spending is divided and diffused, it is obviously much more difficult to spend money quickly. Leaving aside for the moment the question of retaining local control and administration, which is not insoluble, there is much to say in favour of financing technical colleges on the 100 per cent. grant system recently enjoyed by the Emergency Training Colleges. This would at least remove this urgent matter from the realm of fortuitous rateable values and parochial squabbles.

But material and financial difficulties are not the only ones we encounter. The physical impossibility, owing to the shortage of trained staffs, of preparing plans and specifications, and the legal processes involved in the acquiring of sites, set a limit to the speed at which even the money and materials actually available can be used. There must, therefore, be a wise selection of colleges for priority. Meanwhile, those concerned with the colleges which must wait awhile, in spite of pressing needs, should consider whether the current methods of improvisation are to be extended. Are we to continue to crowd still more students into disused chapels and club-rooms and to cram more long legs into still smaller infant desks?

Let us not underestimate the miracles which were performed by improvisation during and after the war. Wooden huts, trestle tables, shift systems, Sunday classes and over-worked teachers all made a valuable contribution to education of all kinds in the schools, in the colleges and in the Services. But there are limits to the usefulness of such a process and the limits have probably been reached. People can spur themselves on for a time to work well under such conditions, hoping that better things lie just ahead, but they cannot go on for ever. The ingenuity with which principals and officials have "managed" to accommodate still more and more classes has, perhaps, hidden the seriousness of the situation. Perhaps it would be better, in the end, if teachers were not so heroic and so prepared to carry on under almost intolerable conditions. Perhaps the reputation they enjoy of never imitating the drastic action of some other trades and professions accounts for a state of affairs in some colleges which would not be tolerated under the Factory Acts for a moment. However this may be, it is my view that most principals would be well

advised to consolidate the work they have in hand instead of straining their slender resources still further. Only those working in scattered buildings can really understand the difficulties involved, the wasted time and the lost efficiency. When "annexes" are large enough to take complete departments, and departments are large enough to have responsible administrative heads and departmental clerical staff, very good organization and work is possible. But this can rarely happen in the small colleges. The constant movement to and fro between buildings of staff, equipment, registers and students uses up endless time and energy and the work of the staffs, never easy, becomes a burden. Men and women who are in technical colleges because they think a great deal about their sciences, their arts and their crafts, and have deliberately chosen to earn their living by teaching them, spend half their working time and much of that which should be leisure on annoying trivialities. More new work under these conditions cannot be very good; to accept it will be to accept a lowering of standards and this we cannot afford to do.

Staffing

The present outcry about the difficulty in obtaining technical teachers is not mere propaganda for the revision of the Burnham Scales. The difficulty is a very real one. My College Governors had recently to make three appointments. One post, for an arts graduate, to teach in the secondary department of the College, and to accept a certain amount of responsibility for its organization, attracted thirty applicants, all experienced teachers, most of them with suitable qualifications, all of them willing to move, to acquire new experience and to earn another £75 a year. From this the situation would appear to be very favourable. But the second post, one for a building teacher, attracted only two applicants, neither with a higher qualification than a Higher National Certificate nor with any teaching experience. The third post was for an electrical engineer. There was one applicant and his qualification was no better than a Higher National Certificate. This is the next greatest problem which faces all colleges, large and small, and, unfortunately, the remedy is not in the hands of the colleges.

Once more, the small college is in a particularly unfortunate position. Over and over again, young and inexperienced men are appointed and trained to the point of usefulness only to be lost immediately to larger colleges which can offer posts carrying extra allowances, the number of such posts being not merely proportional

to the greater bulk of work in the large colleges but also, and quite correctly, to the higher proportion of advanced work. The loss of staff in this manner is inevitable and not entirely bad. Wise governors will adopt the dictum that it is better to employ good men for a short time than poor ones who stay indefinitely, and a college which gains a reputation for being a good training ground will continue to obtain some of the few good ones who are available. But the process can go so far that the college comes to lack stability and character. For this reason it is very desirable that small colleges should be allowed to develop at least one branch of the work to a very high level. In this department there could be gathered together a nucleus of men of high standing who would act as responsible assistants to the Principal and help him to give the college some tone and permanent character. Regional Advisory Councils should remember this when "rationalizing" courses and the Authorities, in consultation with the Ministry, should be more than usually generous in the allocation of responsibility allowances to such "back-bone" departments. Given such a strong central core of activity, even a very small college can be a powerful influence in its own locality and can then perform many minor, but still very important, functions which, without this central focus of activity, could not be entertained. My own College provides an example. It happens that our chemistry department, though in a comparatively small college, is recognized by the Royal Institute of Chemistry. Advantage has been taken of this, and of the fact that Sir Edward Frankland, the great chemist, happened to be born in the locality, to found a Chemical Society that can boast that it has a man of the calibre of Professor Rideal as its very active president and which can regularly attract professors of international repute to lecture in the college. This Society renders a very valuable service to the Lancaster community, comparatively isolated as it is from other industrial centres and centres of learning. As a contrast to this, there has been reported recently an example where the removal of the advanced art classes from a local to a regional college has resulted in the entire disappearance from that locality of art teaching of all kinds and all the valuable activities associated with it.

Administration

Administrative problems vie with our first two for urgent attention. Only those who have had some responsibility for organization in technical colleges can have any real conception of the complexity of

the work. Paradoxically enough, those working in small colleges frequently understand it better than those in large ones. It is obvious that the greater the subdivision of duties the less does any individual know of his colleagues' duties; there may be a much greater volume of administrative and clerical work in a large college but the number of kinds of work done by any individual is greater in the small one. A typical small college, if any college can be typical, may well conduct five National Certificate Courses to the Higher level, half a dozen City and Guilds Courses, a complete range of commercial and professional courses, domestic science, women's crafts, grocery, bakery, hairdressing, catering, civil service courses and a score of others. It may conduct Secondary, Technical, Commercial or Art Departments, full time Secretarial, School Certificate and Intermediate Degree Courses. This work will amount to half a million or more student hours per year and will employ twenty-five to thirty full-time teachers and more than a hundred part-time teachers. The proportion of part-time to full-time teachers is unfavourably high in the small establishment because there are so many branches of the work which demand specialist teachers but which will not provide sufficient work for even one full-time teacher per subject. This throws much extra work upon the full-time teaching and clerical staff. It is very difficult to place the responsibility for the care of equipment or the preparation of apparatus and teaching aids upon part-time teachers; they tend to walk into their classrooms expecting everything to be ready for them. Even the payment of their salaries becomes a substantial piece of office work; they work at odd times, for different periods, at varying rates of payment and they come and go and have influenza and so on.

The number of kinds of activity in a small college is frequently as great as in one twice as big. The amounts of equipment and stationery are smaller but the actual number of orders to be made out is still large; it is as easy to order a gross of books as it is a dozen. And so one could go on. Again, the small college is at a disadvantage because it is traditionally accepted that full-time students need more administration than part-time students. There is some doubt about this. Full-time students are at all times accessible, they are established frequently for long periods, there is no need for constant contact with their employers, their attendance needs little supervision and so on. But the small college receives far less clerical assistance because the majority of its students are "only part-time". At the moment we are receiving in my College, each week, enough Ministry of

Labour documents connected with part-time students to keep a clerk busy for a whole day.

It is impossible to generalize with regard to administrative work because the distribution of tasks between the college and the local education office varies very much from place to place but there are several directions in which reform might be sought.

First, there is the kind of administration directly connected with the teaching process; placing teachers and classes in the right rooms at the right times, giving them syllabuses, materials and apparatus, seeing that they are doing the appropriate work and doing it well, helping them in every possible way. In a large college this work is done for each department by a departmental head who teaches less than half his working time. As we pass down the hierarchy of colleges we may find one providing say 420,000 student hours of instruction within six particular departments each controlled by a head who can devote at least half his time to administration. A somewhat smaller college, providing say, 30,000 student hours within six similar but smaller departments might have no recognized departmental heads at all. Certain members of the staff receiving responsibility allowances would probably be deputed to act in this capacity but they would probably be expected also to teach at least twenty hours per week. Consequently the principal must attempt to keep in close touch with the details of the work in all departments. Many principals have, perforce, acquired a considerable degree of versatility but none can hope to be expert enough in all branches of the work to supervise them even at a modest level. It is quite possible that the departments in the latter college are smaller than those in the former merely because the classes are smaller; the scope of the work may be the same. The amount of administrative detail depends essentially upon the scope and variety of work rather than upon its volume. Consequently, the college which has several "unrecognized" departments verging upon "recognition" experiences a very difficult period in its growth. Recent expansion has brought many establishments to this stage and, while the expansion continues, it is to be hoped that they will be treated generously in this matter of recognition of departments for the "Senior Assistant" system will also fail to help them while their classes are numerous but small.

The greatest opportunity for administrative reform lies in the re-distribution of tasks between colleges and education offices, with a corresponding re-allocation of staffs. At present, some few fortunate colleges receive a lump sum of money from their supporting author-

ities and carry out the whole of the administration within the colleges under powerful Boards of Governors. At the other extreme, most of the work is done, or is supposed to be done, in the Local Education Office, and the Board of Governors is merely a sub-committee of the local Education Committee. In the latter case there is a tendency to under-estimate the amount of work which must still be done on the college premises and to understaff the college office. It is frequently forgotten, for instance, that a technical college office must remain open night and day and on Saturday mornings too. It is frequently forgotten that the college is connected to some thousands of students and to some hundreds of employers by telephone wires.

In county areas, where divisional schemes are in operation, the administrative tasks may be shared between the college, the Local Divisional Office and the County Headquarters some distance away. Even in the county boroughs, the transfer of correspondence, cash, registers and returns between the college and the Education Office can be very irksome, but under the divisional schemes things are much worse. The procession of staff, documents, telephone messages, etc., is repeated between the Divisional Office and the County Headquarters.

Some of the things which can occur are quite incredible. If I quote one or two examples from my own College it is not with the intention of criticizing my own Education Authority which I happen to think is the best in the country. It is simply to illustrate how schemes invented with the best intentions can fail, and to point out how important it is that as the magnitude of our work increases we should endeavour to eliminate the things which frustrate us and detract so much from efficiency.

Until quite recently, all the fees received in my college office were taken across to the Divisional Education Office and a receipt issued. A clerk from the Education Office then walked to the Town Hall, paid the money to the Borough Treasurer (who acts as Finance Officer for the County Authority), and obtained a receipt. A clerk from the Town Hall then walked past the College to the bank and deposited the money there. The bank would finally pass a credit, it is presumed, to the branch holding the County Headquarters account. As it happens, one stage in the proceedings has recently been eliminated; my clerk now pays the money direct to the Town Hall. There is still room for improvement, however, for the bank is just across the road while the Town Hall is half a mile or more away.

Let us suppose I wish to secure recognition of a change in one of the National Certificate schemes. The Ministry of Education

requires the completion of a certain well-known four-page form in quintuplicate. I make out eight copies. (The paper is fairly thick so that I must do them in two batches.) I then write a covering note and send seven forms to the Divisional Education Officer. He writes a covering note and sends six copies to the Chief Education Officer at headquarters. The latter, or his representative, signs five copies and sends them with still another covering note to the Ministry. The Ministry consults the inspectors, reaches a decision and sets the whole process going again in the opposite direction. Some weeks after my application the Divisional Officer sends me a letter which is a copy of a letter from the Chief Education Officer, which is, in turn, a copy of a letter from the Ministry of Education.

Examples like this could be multiplied. One would not feel quite so indignant if the intermediate parties understood, or had any vital interest in, what is written on the forms; it is obvious that the documents can only be handled by clerical assistants, for the officers concerned are far too busy.

Another system subject to severe criticism is that used for the administration of examinations in small colleges and, indeed, in some large ones. Under this system, the Local Education Officer is appointed Examinations Officer to the college. Whilst all communications with the Examination Board or Institute must go through the Education Office, and all examination papers are sent there, the work of collecting entries and fees, arranging rooms, buying materials and so on must obviously be done in the college. From January to June there is a constant exchange of cash, documents and telephone calls between the college and the Education Office and during the examinations themselves the question papers are brought across to the college, day by day, and the scripts likewise taken across to the Education Office after each examination. Errors are hard to avoid and there tends to develop that most unsatisfactory state of affairs, divided responsibility. Thirty years ago, when my particular College was a small Evening Institute, the system was reasonable. Nowadays, when we handle thousands of examination scripts each year it is quite absurd. It is another example of obsolete machinery which should have been replaced long before the college output reached its present magnitude. The grammar schools are apparently quite competent to deal directly with the University Examination Boards. Why must the technical colleges, larger and doing more advanced work, suffer this inconvenience any longer?

The examples I have quoted are all part of a system aimed at

giving local interests a full share in the control of education establishments. As our establishments grow we must change our methods. The technical colleges must be given adequate administrative and clerical staffs and given every opportunity to eliminate all this wasteful duplication of effort. Local interests can be adequately represented on Boards of Governors. Not only should the local Education Committee be represented but also local industrial and commercial interests and on such a scale that business men come to feel that they bear a real share in the responsibilities, for there is no better way of securing their support. Technical colleges generally provide training for commerce and management. Let us see that they are no longer handicapped by administrative procedure which would shock the time study experts. Moreover, when we do provide new buildings, let us be certain we are providing the very best facilities for doing this complicated work with the least possible wastage of time and energy. Principals and their staffs have a much greater contribution to make to the community than the performance of clerical drudgery.

Technical Examinations and Status

Technical studies in this country are completely controlled by a most complex examination system. This is traditional, for the whole of our college organization grew around the early Royal Society of Arts, City and Guilds, and Board of Education Science and Art Examinations. This great examination system, which brings together literally thousands of advisory and moderating committees each year, is unique. Moreover, for many years now, the National Certificate system has offered to the colleges the opportunity of formulating their own syllabuses and devising their own examination papers which, in general, are subject to external assessment only in the final year of each series of examinations. This arrangement was a tremendous concession and a great tribute to the integrity and status of the colleges. But the system was never compulsory and, since many colleges preferred to submit their students to completely external examinations, there grew up the Regional Examining Bodies.

The general tendency has been for the larger colleges to set their own papers and the small ones to use the external bodies. Thus "status" has tended to become associated with this difference. Many colleges have refrained from taking advantage of the system, though they would have liked to acquire the "status", because the internal examinations demand considerably more clerical work within the

college and because many teachers prefer to have their work tested by independent judges. But teachers should accept courageously the confidence placed in them by the awarding bodies and the Ministry and should prove conclusively that they are quite competent to carry something of the independence enjoyed by university teachers.

As colleges grow, therefore, and presuming they are given adequate clerical staffs, they should experiment with these internal examinations. If small colleges are allowed to develop, as I have suggested, "backbone" departments, they should try introducing them. There will always be plenty of work for the Regional Examination Bodies because there will always be many part-time teachers, but it would be more regrettable if one of the greatest concessions ever made to technical colleges were not used to an increasing degree. It is undesirable that the standardization of examinations should go any further; it is important that the character of the work in a particular college be coloured to some extent by the kind of activity found in the district; and it is important that technical teachers should acquire increasing independence as their establishments grow in size and importance.

The disadvantage of external syllabuses and external examinations was brought forcibly to my notice the other day. I had been experimenting with a non-vocational day release course for young civil servants. We had drawn up a syllabus to include amongst other things some rather interesting statistical work, current affairs, play reading and also some domestic electricity. I asked one of my best teachers how he was progressing with these girls and the reply was, "Oh, very well, thank you, but I do wish I had some definite examination to aim for."

This is probably our greatest problem in the technical colleges, large and small, to get away for a while from our administrative troubles, our forms, our lists, our examinations and our statistics, and to do a little quiet thinking about Education.

D. E. Mumford

CAMBRIDGESHIRE TECHNICAL COLLEGE AND SCHOOL OF ART

SINCE the majority of technical colleges were founded and continue to exist primarily to serve the needs of local trades and industries, it is important, before discussing any college in detail, to consider briefly its immediate geographical and economic environment, and in particular any peculiar features which are likely to be reflected in, and give some special distinction to, its work.

In any consideration of Cambridge, first thoughts turn almost automatically to the University. Here it is important to emphasize that the relationship between university and technical college must be totally different in Cambridge from that in a Redbrick town. Cambridge is entirely a non-local, residential university, and the student whose home happens to be in the town cannot become an undergraduate without first securing admission to one of the component colleges. Some undergraduates enrol as Technical College students, particularly in art and language classes, but none of the possibilities of duplication of courses, overlapping or competition which exist in some university towns, occur in Cambridge. To the Technical College, the University is first one of the largest employers of labour in the area. The University sends its employees to appropriate Technical College classes and recruits some staff, particularly on the clerical and secretarial side, from College students, while special courses of which that for laboratory technicians referred to later is an example, have been developed expressly to meet the needs of the University in its capacity of employer. There are of course many other, less direct ways, in which the influence of the University is felt. Research workers provide an invaluable source of part-time teachers, while the development of a strong literary and artistic side to the college would scarcely have been possible without the university atmosphere or the generous support from wives and relatives of members of the university teaching and research staff.

But, although it is often overlooked, Cambridge is much more than a university town. With a population increasing rapidly toward the 100,000 mark, it is a commercial centre serving a large area and the home of a considerable light industry; it is the Government

administrative centre for the eastern region of England, and also a borough and a county town; while to foreign visitors especially it is an important tourist centre.

Separated by more than thirty miles from any town of comparable size, Cambridge is comparatively well served by both road and rail communications. As a result, the Cambridgeshire Technical College and School of Art draws its students, not only from the borough and the county, but from far beyond, and it is no exception to find day students who spend from two to four hours a day travelling between home and College. The general catchment area probably includes a population of between one quarter and one half a million. No instruction is provided by the College for the main industries of the rural area—in this respect of course it merely follows a pattern general throughout the country, in which education for agriculture and horticulture is separated from other forms of further education.

Before discussing recent changes in the work of the College, it is relevant to consider briefly its past history, because historical accidents so often play a significant role in later development. The Cambridge School of Art was founded in 1858. The technical side of the institution grew from the development of the craft side of the School of Art after the Great War. In the 1920s, a Day Trade School, taking full-time students between the ages of thirteen and fourteen for two-year vocational courses, was opened. Senior work in engineering, building and commerce developed slowly throughout the period between the wars, but it was carried on almost entirely in evening classes. During the war, day release developed and increased steadily in volume to such an extent that there are now between 1,500 and 2,000 students in this category. When the school-leaving age was raised in 1947, a complete re-organization became necessary and the College became entirely a Further Education Institution, admitting students only after they had reached the school-leaving age. With this change the Day Trade School vanished, and the more usual departmental organization took its place. Since the war the number of students has nearly doubled; during the last session there was a total enrolment of about 4,500 students, of whom about one-half attended during the day.

Of the 400 full-time students, about half are in courses "end-on" to the modern secondary school. As such courses are a rather unusual feature in Further Education, and as they have proved of particular value in solving one or two problems, typical of the area, which will be referred to later, they perhaps deserve some detailed description.

Every year an entrance examination, consisting of English and arithmetic papers, an intelligence test and an interview, is held for pupils who will reach the school-leaving age before the beginning of the College session in September. While the majority of candidates are from secondary modern schools, there are always a number from private schools and grammar schools. Applicants come not only from Cambridge and Cambridgeshire, but from several surrounding counties which participate in the scheme. At present candidates are offered a choice of engineering, building, secretarial, commercial, cookery, dressmaking, nursery nursing, bakery and matriculation courses. The engineering and building courses are of a year's duration and at the end students normally enter these industries as apprentices. The bakery course is also of one year's duration, but most of the students go on for a further two years in order to take the National Diploma. The nursery nursing course leads to the part-time course for the National Nursery Certificate. The other courses are all normally of two years' duration, though a number of students may continue for a third year in the future. As an experiment this year, some of the courses normally duplicated in September were started instead at Easter, but it is too early to decide whether the complications caused by the double intake outweigh the advantages.

Further reference to some of these courses will be made later, but it is worth emphasizing that they have proved extremely popular and the number of applicants always far exceeds the number of places available. Students who enter through this examination are exempted from the normal fees and may, in exceptional cases, get maintenance grants. Nevertheless, supporting a child for one, two or three years beyond the statutory school-leaving age must place a considerable additional economic burden on many parents and it is a sign of the recognition of the value of these courses that so few students drift away to employment before completing their studies.

From such general considerations we may now turn to describe in more detail developments in the work of the seven departments into which the College is now divided for administrative purposes.

School of Art

The oldest department, the School of Art, has grown considerably, and now has about seventy full-time students preparing for the Ministry of Education's Intermediate Examination in Arts and Crafts and the National Diploma in Design. While the immediate

post-war increase could largely be attributed to students holding Further Education and training grants, there is now a steady annual intake, almost entirely from grammar schools in the area, which should be sufficient at least to maintain the present numbers. In addition to this local recruitment, there is always a small number of students every year from other parts of England outside the normal catchment area. Rather fewer part-time day students than before the war attend art classes, a reflection, perhaps, of the increased employment of married women and the shortage of domestic help. In the industrial part-time day courses, printing, and painting and decorating, for which the School of Art is responsible, there has been the usual steady increase in numbers. Since Cambridge is a centre for the printing industry, notable particularly for high quality work rather than mass production, printing education has always formed an important part of the work of the College. A two-year full-time printing course, which counted as part of the apprenticeship period, was included in the curriculum of the old Day Trade School. This was not entirely satisfactory from the industry's point of view, since it deprived employers to a certain extent of a say in the selection of their apprentices. In the re-organization the full-time course was therefore scrapped and the industry now recruits its apprentices direct from the secondary school, and sends them to the College as part-time day students.

Engineering

Although there is no heavy industry in the catchment area of the College, the total volume of engineering is great enough to provide over 500 students for the Engineering Department. The manufacture of radio sets apart, mass production is not important locally, Cambridge is notable chiefly for high quality radio engineering and instrument making; the Holford plan for Cambridge envisages its further industrial development mainly as a centre for this high quality work and for research. Radio is the chief subject in the Higher National Certificate in electrical engineering, but an alternative major subject of measurements, suitable for power station engineers and those engaged on instrument research, is now being developed. Ordinary and Higher National Certificates in Mechanical Engineering are designed to provide primarily for the drawing office and design side of the industry, but as an alternative to the Ordinary National Certificate in Mechanical Engineering, an instrument-making course, including instrument-making technology and the

fundamentals of instrument design has been developed to the same standard. Part-time day and evening courses in both radio and television servicing, leading to the award of the Radio Trades Examinations Board, have been started. It is notable that these courses recruit chiefly from service mechanics in the radio industry and are not well patronized by the employees of radio agents.

After repeated demands from employers over a period of years and considerable pressure from the Joint Industrial Council for the Motor Vehicle Repairing Trades, courses in automobile engineering were started a year ago. So far the results have not been altogether encouraging. The number of students enrolling at different levels has been considerably less than was expected and their quality in general is considerably lower than that of students from other branches of the engineering industry.

One special feature common to all the engineering courses in the College, and worthy of special note, is the inclusion of English as a compulsory subject throughout the first three years.

Building and Architecture

The building industry is dispersed widely through the whole area in small units, with some larger firms in Cambridge itself. This structure has made it necessary to arrange courses which can be covered by attendance in the day-time only, since it is impossible for many students to return home after an evening class. The Department's programme includes the usual National and Higher National Certificate courses, and City and Guilds courses in brick-work, carpentry and joinery, and plumbing. Although it has been suggested that the number of students taking craft courses should be in the ratio of four or five to one to those taking National Certificate courses, it has been found in practice that a ratio of three to one suits local conditions. One particularly successful development—courses for builders' foremen—originated to a conference of builders and educationalists, called by the Regional Advisory Service of the Ministry of Works. After this conference a programme for half a dozen lecture-discussions was drawn up and circulated to every builder in the area. Over forty senior foremen attended the first lecture, and an attendance of over 90 per cent. was maintained throughout all subsequent sessions. Discussion at first was hesitant, and it was obvious that some feared to ask questions which might have revealed deficiencies in their own knowledge. By degrees, however, in the friendly and informal atmosphere which was always

maintained, self-consciousness disappeared. Another equally successful session, based on topics suggested by the foremen themselves, followed, and finally on their own initiative the foremen formed a new association—"The Cambridge and District Builders' Foremen and Clerks of Works Association," which took over the organization of the lectures and discussions, and the arrangements for outings and visits to buildings in course of construction, to factories and research establishments, and other places of interest.

With the appointment of a full-time Responsible Lecturer in Architecture, it has become possible to establish day-time courses in architecture. The number of full-time students is at present small, and the course is so arranged that full-time and part-time students can work together. The part-time day students come mainly from Government and local government departments, while students working in private offices can usually attend only in the evenings.

Commerce

Full-time secretarial training is now given at two levels; there is a two-year course for girls recruited at the school-leaving age through the entrance examination and a nine months' senior course for girls who have reached at least School Certificate standard. The senior course, though a recent innovation, now attracts an entry of fifty to sixty girls each year, from public schools, grammar schools and even universities. Students take the usual speed examinations, and a College Diploma is awarded to those who complete the course satisfactorily and reach certain specified standards in shorthand and typewriting. Although between sixty and 100 girls complete the secretarial courses each year, there is no sign yet that the local employment market is saturated.

The two year business training course for boys and girls coming in through the entrance examination has recently been separated into secretarial and commercial sides. The latter not only gives a training suitable for future office workers, but acts also as a feeder to the full-time Senior Commercial course, which prepares students for the intermediate examinations of the various professional bodies. Previously, recruitment for this course, mainly from grammar schools, was rather sporadic, but this additional source of students should put it on a firm foundation.

The total demand for courses leading to professional qualifications is comparatively large, but it is so diversified that organization, without accepting groups of uneconomic size or amalgamating

students with widely different aims and abilities, is difficult. Tutorial groups provide a partial answer to the difficulties, but the only really satisfactory solution lies in the implementation of the recommendations of the Carr-Saunders Committee for a common Intermediate examination. Similar difficulties are met in organizing courses for the retail trades. Little local interest has so far been shown in either the National Certificate in Commerce or in business management courses, and it is obvious that business itself is by no means fully convinced yet of their usefulness.

Since regional offices of all the main Government departments are now situated in Cambridge, there is a large demand for classes for civil servants, particularly in the clerical grade. Only a small proportion, however, appear to be interested in working for the promotion examinations and, for many, the civil service seems to be an interlude between school and marriage, rather than a serious career. While part-time day release is granted generously by the civil service and the retail trades, very few students apart from shorthand-typists and machine operators, are yet released from offices.

Science and Technology

The Science Department has grown to a considerable size from scratch in less than four years and now provides instruction to final degree standard in the principal sciences, chemistry, physics, botany, zoology and mathematics, as well as a range of technological courses.

While the total demand for science subjects is considerable, it is not possible to depend on a regular annual intake of students starting at the same level and working for a particular qualification. The usual organized courses, depending on such a steady demand, cannot therefore be arranged economically. Instead, for each of the principal science subjects and mathematics, instruction is provided in eight stages each occupying a year of part-time study with attendance for one session, each week. Thus the student who comes for a whole day and an evening—three sessions—can cover one stage of three different subjects in a year. In general, the first two stages cover the requirements of London Matriculation, while the syllabuses of the London Intermediate and Final Honours B.Sc. and other examinations of equivalent standard are covered by Stages III and IV and Stages V to VIII respectively. At the lower levels day and evening classes are duplicated so that students unable to come at all

during the day can keep pace with the part-time day students by attending on several evenings. At the more advanced stages, the day and evening subjects are partially interchanged each year, so that the evening student can cover the same ground as the day student, though in a longer period of time. This "pigeon-hole" structure makes it possible to fit any student immediately into a class appropriate to his attainment and needs in any subject; it has been most successful in meeting the fluctuating and varied demands of the area. In the first place, the syllabuses for Stages I and II and Stages III and IV were arranged to be parallel and independent rather than consecutive, so that the structure would also serve a full-time student, who merely took two stages in a year instead of one. Through the growth in numbers of full-time students it has been possible to end this rather clumsy arrangement and separate full and part-time students up to the end of Stage IV, though at the more advanced level some dovetailing is still necessary.

Bakery classes were started four years ago, and the development from them of a full-time School of Bakery perhaps deserves some detailed description, since it involved difficulties which are very common in an area where the population is widely dispersed and there is no considerable concentration of industry. The educational side of the bakery trade organization has been well organized for many years, and when classes in Cambridge were first proposed they were welcomed enthusiastically by the local members of the trade. Over thirty students enrolled in the first session during which the practical classes were held in a local bakery under a part-time teacher. Next year there was a serious drop in numbers and a careful enquiry showed that, comparatively, there were very few young people employed in the area. Moreover, largely perhaps owing to the distribution of population, there were very few large bakeries, and from the characteristic small unit it was almost impossible to give part-time day release, however keen and willing its owner. A dearth of men qualified and free to act as part-time teachers was also evident. In these circumstances it was apparent that a Bakery School based on part-time attendance could only function intermittently and the bold decision to start a full-time school was therefore taken. The impossibility of carrying on successfully in outside premises was also recognized and the classes were transferred to the Technical College, and a full-time teacher appointed. Equipment was borrowed and use made of the Domestic Science Department ovens until a four-deck gas-fired steampipe oven was finally installed. Bakery was

added to the courses offered at the entrance examination; though at first only two students opted for it outright, seven others, who had failed to get in elsewhere, took it as a second choice. In spite of this, the class settled down remarkably well and at the end of the preliminary year five students elected to remain for a further two years to take the National Diploma. The number of students giving bakery as a first choice increased in the following year and all of them at the end of the preliminary year decided to continue in the National Diploma course. In the entrance examinations held this year the number of candidates choosing bakery was greater than the number of places available. Applications for places in the National Diploma course are now also being received from outside. Part-time classes for the City and Guilds examinations, patronized largely by older men and master bakers, have been continued in the afternoon and evening, but it is to the policy of recruiting direct from school for a full-time course that the success of the School of Bakery is really due. The greatest possible help and co-operation have been received from the local master bakers, most of whom are members of the Bakery Students' Society, which, with 120 members, performs a valuable social and educational function.

Reference has already been made to the courses for laboratory technicians, arranged largely for university assistants. Of six subjects —elementary laboratory technique, workshop practice, chemical, biological and medical laboratory technique, and photographic techniques—each occupying one year's instruction, a student must study at least four. Examinations, controlled by a managing committee with representatives of the Technical College, the University of Cambridge Local Examinations Syndicate, and the University and Assistants Joint Board, are held at the end of each session; Certificates of Proficiency signed on behalf of the Technical College, and the University Examinations Syndicate are awarded at the end of the four-year course to students who have completed it successfully and passed the annual examinations. The classes are arranged in the evenings, but all the students are released by the University for one day a week to study appropriate science subjects and an endorsement showing the stage reached in pure science is made on the certificate. The institution of this course of training has had a stimulating effect and has helped to make people aware that what was often thought of as a dead-end job can in fact offer a progressive career requiring a good scientific background and a high measure of skill.

One failure should also be mentioned. In collaboration with the laundry industry, a special part-time preliminary training course was arranged for those leaving school and entering the industry, but in spite of the very generous offer by the industry of two and a half days' part-time release per week, the number of recruits was too small to justify continuation of the course.

English and Social Studies

The creation of a department of English and Social Studies has been one of the most striking developments of recent years. English is a compulsory subject in the College in all standard full and part-time courses; most full-time courses in addition include a generous allocation of time to other arts subjects, such as history, geography, languages and music. Unification of the responsibility for arts subjects has led to a general improvement in quality, but it is still too early to assess its full benefit to the work of the College.

The responsibilities of the department, which now includes fifteen full-time lecturers, go far beyond service to other departments. A full-time matriculation course with about fifty students recruited partly from those who failed to reach the grammar school, through illness, moving home, late development or other causes, partly from private schools, and partly from older people who have found matriculation necessary before proceeding to some other qualification, has been run for several years; from it has developed an Inter. B.A. stream, from which students go on to teachers' training colleges, to professions, and occasionally to universities. Part-time day classes in this field failed after the first two years when the accumulated demand had been met, but part-time evening classes are well patronized and may lead on to final degree work.

A full-time course for the University of London Diploma in Social Studies is to be started in September, together with a part-time evening course leading to the same qualification. Recruitment so far has come from two main sources—social workers who hold no recognized qualification and married women, freed to take up a career through their families growing up.

Evening language classes in French, German, Spanish, Italian and Russian attract about 300 students annually, the principal demand being, of course, for French and German. In each language there is a "beginners' " stage; in French and German a "refresher" group, which is gradually extinguished during the session, is started each year for those who wish to revise rapidly before passing on to

more advanced stage. Although there are three, four or five stages in each language for people of different levels of attainment, it is still difficult to secure the desirable degree of homogeneity in each class, because students are not always willing to enter at the appropriate level. Another regular feature—one common to most work in the field of adult education—is a decline in attendance during the session, when some of the initial enthusiasm, often prompted by a summer holiday abroad, has evaporated and students find that solid work, and not mere attendance at classes, is necessary for progress. As a first attempt to meet these difficulties, all language students in future will be required to submit to an entrance test and to give an undertaking to attend regularly.

Non-vocational evening courses also form an important part of the work of the department. Although the subjects covered and the demands vary from year to year, certain features remain fairly constant. Psychology in any form and elementary logic (usually under some such title as "Clear Thinking") invariably attract and retain large attendances, and there is a steady demand for literature and philosophy, as well as for "appreciation" classes in painting, architecture and the various arts. On the other hand, current affairs, however presented, invariably fails, although a straightforward academic course in constitutional history has run successfully for several years.

The range of work in librarianship, music, drama and speech training has been increasing steadily, but the most spectacular development is perhaps in English courses for foreign students. Enrolments have increased in three years from less than a dozen to more than 300; and most of the students are now taking the examinations in English arranged by the University of Cambridge Local Examinations Syndicate. The courses are arranged in six stages, of which the last three cover the syllabus for the Lower Certificate, the Certificate of Proficiency and the Diploma in English Studies respectively. The students come largely from Switzerland, Scandinavia, France, Holland and Italy, but almost every European country is represented; they include undergraduates, research workers, civil servants and teachers. Most of them live with private families in Cambridge, receiving their keep and pocket money in return for general help in the home; the attraction of Cambridge itself, the many residents with friends and connections abroad and the large number of homes where these students are welcome have all played a part in the unexpected development. Former students and the

good offices of the British Council have helped to make these courses widely known abroad, and telephone calls reserving places have even been received from as far away as Stockholm. An Overseas Club has been formed to arrange social activities, lectures on Britain and various aspects of British life, and visits to other parts of the country, of which the most popular are usually London and "the other place".

In the limited space available, only developments which may be of some interest elsewhere have been mentioned and no attempt has been made to draw a comprehensive picture of the work of the College. No account would be complete, however, without some tribute to the generous help and co-operation received from the University and from the local trades and industries, with whom close contact is maintained through the Advisory Committees which have been formed at various times for engineering, building, printing, painting and decorating, architecture, commerce, bakery, laundry, hairdressing and catering.

Steps have already been taken to establish a closer liaison with contributory schools, to ensure that further education follows closely and naturally on the secondary stage, and that appropriate courses leading to recognized qualifications are available for those of all types of ability.

Perhaps when it is recognized that, through the secondary, technical and modern schools and the College of Further Education, the gateway can be opened to a range of careers just as interesting, honourable and rewarding as those approached by the grammar school-University avenue, the burning problem of "parity of esteem" between different forms of secondary education will be in sight of solution.

Robert E. Presswood

REPORT FROM CARDIFF

CARDIFF begins with many advantages in the development of a comprehensive scheme of further education. During the last century the population has increased steadily until, at the present time, there are almost a quarter of a million people resident within the city boundaries. From a purely local standpoint, the City Council is faced with demands for further education facilities ranging from advanced training in technology and commerce at university degree level to meeting language difficulties experienced by coloured nationalities resident in the docks area. Cardiff is, however, much more than a local centre for further education. For many years the facilities available in the city have met the needs of students living in the mining communities of Glamorgan and other parts of Wales, and there has been a continuous increase in the number of "extra district" students seeking to continue their education in Cardiff. The city has been chosen as the administrative headquarters of many government departments, whilst its industrial and commercial importance is, of course, widely recognized. Thus, in many ways, Cardiff has the duty of meeting national as well as local needs. As in many other areas, the authority is faced with the need for an immediate expansion of further education facilities. This need is particularly great in technological, commercial and art education, and plans for developments within the next few years have now reached an advanced stage. At the same time, there is great need for new developments in further education. Whilst informal adult education has received encouragement in many ways, there is an urgent need to establish community centres in most areas of the city. This need is made apparent by the enthusiasm of local community associations and the often expressed desire to enter into partnership with the local education authority. It is with these considerations in mind that the authority have made plans for immediate and long-term developments which will encourage participation in every aspect of further education.

The importance of technological and commercial education found expression in the provision of a technical college in the early years of the century. The building is one of the group comprising the civic centre of Cardiff in Cathays Park. It is centrally situated and

conveniently accessible to the whole of South Wales, whilst arrangements are made to accommodate students from further afield in approved lodgings. The increased demand for the facilities provided by the College is shown by the fact that there are more students in attendance than ever before in its history. There are, in fact, 1,212 full-time students and 6,478 part-time students on the books of the Technical College, the standard of work ranging from preliminary training to university degree courses, and, in variety, from purely vocational training, to an encouragement of interest in music, literature and the arts. Increased demand for accommodation has resulted in certain departments being placed in separate buildings, whilst the Authority recently decided to create a separate college for art education.

Space does not permit of giving detailed information concerning the nature and variety of courses provided in the Cardiff Technical College at present. Science and technology includes departments reflecting regional needs for training in chemistry, mathematics, physics, engineering, building, confectionery, bakery and catering. For many years, the College has prepared students for degree qualifications of the University of London in chemistry, general science, engineering and physics. Normally, approximately sixty students sit for the final university degree examination each year. The Building Department, together with the Welsh School of Catering and women's craft classes, are housed temporarily in a former primary school. All these departments provide for full-time and part-time students.

A large department of commerce and administration provides courses ranging from junior secretarial courses to University of London degree qualifications in commerce and economics. This department, providing as it does for 133 full-time and 3,278 part-time students forms an important liaison with the commercial interests for which Cardiff is well known.

The Pharmacy Department of the College is known as the Welsh College of Pharmacy. The courses are designed primarily for internal degrees of the University of Wales, students taking the B.Pharm. and M.Pharm. qualifications as well as diplomas in pharmacy.

The maritime interests of Cardiff are reflected in the Department of Navigation. This department provides instruction for those who wish to obtain Ministry of Transport Certificates of Competency. The department also includes the Reardon Smith Nautical School, which gives preliminary training for boys of thirteen to fifteen.

The Welsh School of Architecture is also a department of the Technical College recognized by the Royal Institute of British Architects and functioning in conjunction with the University of Wales. Courses for the B.Arch. degree of the University of Wales and the A.R.I.B.A. diploma are arranged.

These recent demands have made it necessary to organize separate departments for adult part-time courses within the College. These include appreciation of music, orchestra training, speech training and drama, ballet, poetry and literature, journalism, modern languages, sound studies, psychology and librarianship.

The foregoing information is given in order that there may be some appreciation of the nature and variety of courses provided in or near the present Technical College. The authority have become increasingly aware that the centrally situated College must be reserved for advanced work. The problem has thus become the two-fold one of extending facilities for advanced work, and of providing junior colleges which will cater for preliminary courses and for county college activities. To meet the first of these problems, the authority have acquired a further acre of land in Cathays Park. On this site it is intended to provide up-to-date facilities for engineering, building, applied physics and chemistry. As the hall in the main college building is too small for large assemblies, a large assembly hall, together with staff and student amenities will be included in the new building. This development is regarded as being of immediate importance.

A more immediate development will be the provision of a branch Technical College or County College in the Llandaff area. This will be the first of five new colleges situated towards the periphery of the city. Two of these colleges will have a specialized function in addition to anticipating the need for providing physical and social training for young people who are required to attend the County College. For the Llandaff College, agreement has been reached concerning the acquisition of a fourteen acre site, and it is anticipated that building will commence in 1951–2. The estimated cost of the project is £200,000. A schedule of accommodation and preliminary sketch plans have been discussed with the Ministry of Education representatives. The accommodation includes ten laboratories and work-shops for engineering, seven for building technology, eight classrooms, together with administration rooms, social amenities, gymnasia, etc. These facilities will provide for existing part-time day release classes in engineering and building and

will enable more part-time day classes in commerce to be arranged.

In reviewing the organization of courses for the forthcoming session, the authority have already decided upon some important developments. It is felt, for example, that there will be a response to the opportunity of taking part-time courses of study for the B.A. degree of the University of London. These courses are designed primarily for teachers and the professional people who seek to obtain university qualifications. It is also intended to provide courses for those who wish to qualify for the University of London Certificate of Proficiency in Modern Languages. The Committee did not feel that Welsh could be appropriately included in this group, and application has been made to the University of Wales for recognition of courses in the Welsh Language in the award of a certificate of proficiency.

The Cardiff Technical College has already become a regional centre of further education. Indeed, many of its facilities are of importance to Wales, as a whole. The immediate and long-term developments which the authority have in mind will enhance the importance of the central college by reserving its facilities for advanced and specialized work. They will ensure that students are given preliminary training in the county colleges and, in this way, meet the demand for technological and commercial training at all levels.

The demand for training in art and crafts has increased so greatly in Cardiff during the post-war period that the education authority have decided to establish a separate College of Art and Crafts. A former voluntary school, which was requisitioned for military purposes during the war, has been purchased from the Church in Wales School Authorities. These premises are centrally situated and, though extensions and adaptations are to be carried out, they are already in use by some 150 full-time and 700 part-time students. The plans which have been prepared provide for two three-story wings at either end of the building and for an entirely new façade on the Cathays Park side. Internally, the whole building will be reorganized, the complete schedule of extended and improved accommodation, including full-scale facilities for drawing and painting, pictorial design and illustration and for a wide variety of crafts. The College is already recognized as a centre for the training of art teachers, the course being conducted in conjunction with the University College of South Wales and Monmouthshire. It is anticipated that the number of students taking this graduate course will increase considerably when improved facilities are available.

The scheme for adaptation and extension of the premises now in use as a College of Art and Crafts is estimated to cost £55,500. Plans have been approved at the preliminary stage, and it is expected that the work will be included in the 1952–3 programme. This regional College of Art and Crafts will function in close co-operation with the City of Cardiff Training College, which has just opened. This Training College will provide a third-year course in art and craft for qualified teachers, the former emergency training college premises being used for this purpose.

In 1948, the Cardiff City Council received the Cardiff Castle as a gift from the Marquess of Bute. It was desired to use the magnificent gift in a manner which would bring credit, pleasure and benefit, not only to the citizens of Cardiff, but to the people of Wales as a whole. Visitors from all part of Wales and overseas have been greatly impressed by the Castle and the surrounding park. After careful deliberations, the City Council decided that the building should be used as a College of Music and Drama. The Castle is regarded as ideal for this purpose, since it provides a dignified and historic atmosphere suited to the encouragement of cultural activities. The situation in the centre of the city is convenient, and the many rooms, which vary in size, are sufficient to provide for individual and group tuition. Very few adaptations have been necessary to provide for training in music. The detailed work involved in establishing the College has been carried out by Dr. Harold Hind, the authority's music adviser, who has acted as principal since the College opened in September, 1949. The members of the music staff are well-known musicians. When the College first opened, there was an immediate response from students seeking individual and group tuition. Some three hundred students are enrolled for music, and more than eighty have attended the College for training in drama. One of the larger rooms is to be adapted as a small theatre, whilst the whole of the work of the Drama Department of the College is to be placed in the charge of a person qualified in drama. It is intended that the person appointed will act as drama adviser to the authority and that voluntary dramatic societies and schools will have the benefit of his or her advice and guidance, if they so desire.

The authority believe that the College of Music and Drama should be national in character. With a view to obtaining recognition of national status, negotiations have been opened with the Welsh Joint Education Committee. It is hoped that, as a result of these, students will come from all parts of Wales. In this connection, the

need to encourage Welsh aspects of music and drama has been borne in mind. Penillion singing is included in the curriculum, whilst a course in Welsh drama will also be arranged and plays presented in both Welsh and English.

It is anticipated that extended provision for technical and commercial education will release accommodation for encouraging an interest in women's crafts. It is intended that the premises now largely occupied by the Departments of Building and the Welsh School of Catering will provide for classes which will lead to qualifications of the City and Guilds of London Institute in dressmaking. It is confidently expected that, with additional accommodation available, there will be an immediate response to the full range of courses which would be available in a centre for women's work.

So far, mention has been made of further education establishments which are centrally situated and which are intended to meet the needs of the city as a whole. There is an equal need to provide amenities in the various districts of the city. This has been done to a limited extent in evening institutes which provide preliminary training for boys and girls who have recently left school. There has been an increasing demand for adult classes attached to the evening institutes, these being mainly concerned with dressmaking, millinery, leatherwork, and so on. A far wider field of interest is represented in community activities, variously known as Citizens' Associations, Tenants' Associations or Community Associations. These associations are to be found in all areas of the city and they function on an entirely voluntary basis. The help of the education authority has been sought in the provision of paid instructors for drama, literature, psychology, crafts, and so on. It is, however, becoming increasingly evident that these community activities can only be satisfactorily encouraged by a closer partnership with the education authority in the establishment of community centres. It is interesting to note that the first of these will be in the docks area. Premises recently used as a club and hostel for coloured seamen have been vacated by the Colonial Office and acquired by the Education Committee. A joint committee, representative of the Bute Town Community Association and the ward councillors, has been formed, it being arranged that the Community Association chairman shall be chairman of the Community Centre. The day-to-day organization of activities in the Centre will depend upon local initiative and interest and a warden, paid by the local authority, will be responsible for using this to the best advantage. The development of this community

centre, which will provide in the main for coloured people, will be watched with interest by the authority. The members are already aware that the Centre must be more than a social centre if it is to be successful and classes in reading and writing, discussion groups, film shows and craft classes have already been arranged. Whilst the authority have undertaken the major share of painting and renovation of the premises, a considerable amount of this work is being carried out voluntarily by members of the docks community. It is hoped that this, the first community centre in Cardiff, will be officially opened this month.

The Cardiff Youth Committee pursues an active policy of encouraging young people to use their leisure time in ways which will promote enjoyment and healthy all-round development. There are some four hundred youth organizations in the City. In many of these, the Youth Committee have appointed paid instructors for craft work, drama, physical training and dancing. There are also two Centres which are owned and maintained by the authority and which, according to an arranged programme, are used by the youth organizations in the area in which the centre is situated. The Central Boys' Club is managed by a joint committee, representative of the Youth Committee and voluntary workers. It is a modern building which includes a gymnasium, library, craft rooms, as well as social and recreational facilities. The authority's contribution to the centrally situated club is approximately £2,000 per annum.

This general survey of further education in Cardiff, with its indications of the developments which the authority have in mind, has as its background the keen and lively interest of the Cardiff people in educational activities. This is expressed in attention to matters affecting children at school, and in an appreciation of the duty of the local education authority to provide facilities for all sections of the community. It is the expressed desire of the City Council and Education Committee that there shall be a progressive development of further education. In doing so, the authority realize that there must be close co-operation with the University College of South Wales and Monmouthshire and in the Workers' Educational Association.

Spencer Vaughan Thomas

REPORT FROM HERTFORDSHIRE

PLANS and interim provision for Further Education in Hertfordshire inevitably reflect the changing character of the county. Week-end visitors to Lamb's "fine corn country" may be less aware than local residents of the prominence given to Hertfordshire in planning documents, but all must see in the near future sharp changes in the landscape and the disappearance of some familiar landmarks. The county is a reception area to four new towns and a number of minor townships in the form of L.C.C. estates. These new settlements, together with the expansion of established areas, will increase the present population of 596,010 by nearly 50 per cent. in the next twenty to twenty-five years.

Ultimately new building may produce a more homogeneous population pattern than the present uneven distribution of hundreds of thousands in a narrow belt on the southern fringe near the Middlesex border, and comparatively thin placements in the remaining four-fifths of the county. The place of development is such that although Hertfordshire might be considered as a "Development Area", without the heritage of classification as a "Distressed Area", it could be argued that its distresses are still to come. Even if they do not take the form of unemployment and its accompanying social malaise, they may nevertheless produce a new kind of hardship which must persist so long as national planning exhibits an inadequate financial relationship to the structure and machinery of local government. Without some form of special relief, flexible schemes may become uncertain schemes, and interim standards prevail as permanent standards.

In 1939 Hertfordshire possessed only two modest Technical and Art Institutes, and an Institute of Horticulture and Agriculture at Oaklands, near St. Albans. It is estimated that to meet future needs in Further Education the county will require three major Technical Colleges, nine County Colleges, a central College of Art and expanded facilities for agricultural and horticultural education. At present Technical Colleges are being built at Watford and Hatfield and plans for a third at Letchworth are being prepared, but the widespread demand for various forms of day-release work, more advanced standards in evening classes (especially in vocational

subjects), courses leading to professional qualifications, and more appropriate facilities for adult education, cannot wait upon distant events; *ad hoc* measures must serve.

To meet immediate demands, Further Education Centres have been established, which, in addition to meeting strong requests for day-release classes for general education, also house flourishing Evening Institutes. These centres were initially called Day Continuation Schools, but the name was abandoned for the very reasons which once induced Mr. Butler to give a prize for a more suitable title. Although the Centres are, in effect, enquiry points for the future County Colleges, none of them possesses buildings or amenities which could be termed "collegiate" in character or atmosphere, and rather than employ a nationally recognized term, before the appointed day, an "interim" title was adopted for an "interim" measure.

With three possible exceptions, the Centres occupy buildings which pessimists could easily criticize as standing examples of the housing errors partly responsible for the downfall of the Day Continuation Schools of the Fisher Act. Yet each of these possesses one feature which the ingenuity of imaginative teachers has been able to turn to good account. One rents premises from a boys' club, and although its teaching rooms are small, it has the use of a good gymnasium. Another exists in a private hall, lacking adequate ancillary rooms, but has been able to make a feature of drama work. A third carries on its work in a number of buildings which include two former N.F.S. huts in a poor state of repair and a Methodist Sunday-school room with inadequate class-room spaces. It possesses, however, a comparatively large and freshly decorated church hall, which can be used for assembly, concerts and exhibitions as well as teaching accommodation.

The remaining Centres are more fortunate. For two of them big houses (with large gardens) have been converted and redecorated. Attractive furnishings and bright colour schemes have been provided, and an attempt made to create an adult environment for students whose immediate school environment was more formal and conventional. The conversion of these houses, built in the days of many servants and greater leisure, brings special problems to solve in heating, lighting and sanitation. A careful balance sheet must be drawn up by those who believe that the stately homes of England are an automatic solution to the problem of County College buildings. The two converted houses have much to offer; so also has the

remaining Centre, which has inherited the premises of an old grammar school; this building has been redecorated, new furniture of modern design provided, a rubble-surfaced playground has been grassed over and turned into a trim lawn; while dull corners have been brightened with flowering shrubs.

The wear and tear on buildings and equipment when day-release classes are followed by a heavy programme of evening classes demands special thought about design and fittings for County Colleges. The Hertfordshire Centres, with their varying physical features, provide valuable opportunities for experiment, and a chance to study at first-hand the many complex problems implicit in day-release work.

As pilot-schemes, the Centres have their value, but they cannot satisfy, either now or in the future, the demand for modern technical education or the requirements of enlightened industry. The completion of Watford Technical College, with a good department for printing, and of Hatfield Technical College, with a wide range of facilities for engineering, building and commerce, will go a considerable way to meet the needs of the south, south-western and central areas. Letchworth will be the main point of focus for the north, but the needs of the eastern area remain complicated, and any provision for advanced forms of technology will involve regional considerations.

Until the Technical Colleges are completed, much of the elementary work in technology must take place at Further Education Centres, and they will probably remain, though changed in form and status, contributory agencies through which many students will pass before entering the Technical Colleges. The Further Education Centres may meet elementary needs, but recognized courses in Technology can only be provided effectively in properly planned institutions, and for these courses the Hertfordshire student looks to the Colleges of Middlesex, Essex and London. For many years in Technical Education, Hertfordshire has lived by the grace of its southern neighbours, and much of the provision for technology is expressed not in buildings, but in the budget figures for "out-county" fees.

Formal Further Education, outside the field of adult liberal studies conducted by the W.E.A. and the Extra Mural Boards, continues through the large number of evening classes which grow yearly in number and type of subject. The familiar comment of rudimentary classes in rough and ready accommodation will still be heard,

although the observation is less valid than in the pre-war years. Work goes on in primary schools, village halls, hired premises, and places declared unsuitable for other forms of education. Students living in an area served by a Further Education Centre with good buildings must be considered lucky in their choice of neighbourhood.

Hertfordshire's immediate problem is therefore to find ways and means of providing for its growing population, adequate facilites for vocational studies, and the groundwork of general education which progressive schemes of day-release require. It has been the policy of the county to give encouragement, through a grant formula based on class-work, to the established responsible bodies like the W.E.A. and the Extra-Mural Boards, and over 90 per cent. of adult education in the traditional sense of the phrase is carried out by these voluntary organizations. This does not mean that the County Council wishes to divest itself of its responsibilities for work of this standard; when buildings and teachers are available, it will seek to establish appropriate classes, but it is recognized that the voluntary organizations have a special contribution to make, and that, by agreement with the local education authority, certain types of adult classes may succeed in some areas under voluntary auspices.

The following tables indicate the growth in number of students in formal classes between 1939 and 1949:

	1939	1949
Evening classes	7,890	16,482
Day-release classes	Nil	2,492
Full-time classes	59	207
Adult classes	400	1,701
Out-county courses (*a*) full-time	139	273
(*b*) part-time	1,398	2,946

The dividing line between formal classes and informal work can be arbitrary and is sometimes a matter of convenience of regulations rather than any difference in purpose or standard. In a number of places short courses of a purposeful character are conducted through the Women's Institutes and Townswomen's Guilds, both of which received financial aid for their lecture work. A large number of cultural activities such as lectures, concerts, exhibitions, etc., are also arranged through local societies which receive deficit grants from the County Council for specific projects. In this way

the County Council becomes the twentieth-century patron of the arts without destroying the vitality of independent organizations. The rural centre at Ashwell and the urban centre at Kingham Hall, Watford, are two examples of places where adults can have access to a wide range of cultural activities of good standard.

In the field of Youth Service, no clubs are sponsored directly by the County Council, but help is given through capital grants and the provision of part-time paid leaders. Approximately sixty such Leaders are employed annually. County organizations of Scouts, Guides, Cadets, and Young Farmers' Clubs and the Boys' Brigade also receive help towards their administrative costs.

Further Education in Hertfordshire shows a future pattern of direct provision for technical education, and a continuation of the present policy of indirect provision through the system of grant-aid to organizations and individuals. It is believed that this policy will ensure that degree of flexibility which a quickly changing concept of Further Education demands.

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THE EDUCATED ILLITERATE

WHEN he is young, the teacher of English in further education is probably flattered when his colleagues turn over to his special attention a student who cannot proceed with his studies because, although he has received what we call a good education, he simply cannot write English. After a glance at the work of such a student, the English teacher's satisfaction usually changes to something like despair. The question always is: where can I start?

We can see how difficult the problem is if we examine some examples. Forty young men, all fairly well educated and of at least average intelligence, were asked to write about a dozen lines on a topic chosen from a list of three. They had half an hour for the task, and since they knew that it was part of a test by which they would be graded, they had reason to do their best. The four worst efforts are reproduced below. Every such group of forty produces two or three pieces of work of this standard.

(A) HEADLINES

Headlines for a newspaper or magazine are designed for the purpose of drawing the attention of the public by dramatising an ordinary event into a monstrous calamity Headlines always are made to exagerate an event especially a political event when the papers print the news of the party towards which there sympathys lean These Headlines are no real guide to the news but rather a very good way of sending up sales.

This was written by a public school boy, aged eighteen and a half, who in 1948 passed the School Certificate with six credits, including English Language, and two passes, one of them in English Literature.

(B) WEATHER FORECASTS

Weather forecasts! are they ever correct? How many times have you heard people say that, a great number of times I expect. Well contrarary to many opinions the weather forecasts, given by Air Ministry and subsiquently passed on to the public by the B.B.C. and the papers, are on the average very true pitictions of forthcoming weather.

Possibly the reason for most people's discontent with the forecasts, is because the feel that the forecasts do not do their job, but in actual fact they do it very well. If the weather is forecast to be sunny and it

turns out cloudy for you it is only because there is local cloud around you. It does not mean that the forecast for the rest of the country is wrong.

The writer of (B) was also a public school boy, aged eighteen, who in 1947 passed the School Certificate with four credits, one pass, and one distinction. His credits included English Language and English Literature, and his distinction was in Divinity.

(C) Guide Books

Guide books are written, as a rule, in two catorgaries, those which represent the truth and those which misrepresent it. It is possible to pick up a highly illuminated book which discribes a colourful mystic oriental city, with its bazzars and narrow streets and hot restful air, this, in actual fact, describes only half the story, there is the nauseating smell of animals and unwashed bazzar keepers, and the garbage in the street that possible over cancells out the colourful city of the guide book. On the other hand books on continental cities generally stick to the true representation of the city, with the fine architecture and local landmarks, with this visiters are not disapointed in what is seen after reading a guide book.

The writer of this was a grammar school boy, aged eighteen, who passed the School Certificate in 1947 with a distinction in Geography, five credits, including English Language, and a pass in French. He, and the writers of (A) and (B) had all remained at school until March, 1950, one month before writing the above essays.

(D) Weather Forecasts

With the aid of weather stations in many parts of the world manned by highly skilled scientists, who collect data on weather conditions around there particular area, this is done with the aid of many instruments. Radar is the chief instrument, because by which they are able to track thunderstorms and large rain storms many miles away and also to track the course of ballons sent up to record conditions above. Pilots of aircraft also send weather reports in, as to what weather they experience on there flights. Weather ships are an important part of weather forcasting because it is on large stretches of ocean that many weather conditions begin.

All this carefully collected data is sent to a central weather station and there it is made into weather forcast for future conditions.

The writer of this was a grammar school boy who left school in 1946. Since then he has completed a three-years' apprenticeship as

a fitter. During this time he attended continuation classes, and passed the First Year National Certificate in 1948, and the Second Year in 1949.

If we examine these extracts we notice first that there is a good deal of simple carelessness. The writers almost certainly did read over their work when they had finished it, but they just did not see such slips as "the" for "they", "possible" for "possibly", and "because by which" for, presumably, "because by this". The inability to notice such things when he reads over his work is common with this type of student.

Secondly, we notice the writers' ignorance of spelling and punctuation. But a certain amount of this too is carelessness rather than ignorance. C, for example, spells "describes" once correctly and once incorrectly, while D twice failed to copy "forecast" correctly from his question paper. (He did not give his work a title.)

There are, however, two much more important things for the English teacher to notice in these writings. The first is the use of words. C actually misuses words; he picks words such as "illuminated" and "mystic" which are near enough the correct words—"illustrated" and "mysterious"—for the reader to guess his meaning. But these are not malapropisms. He used these words, not because they sounded like the correct words, but because they meant something roughly similar to the idea he had in his mind. All four writers show symptoms of this same disease. They either do not know, or they entirely disregard the precise meanings of words. A "exaggerates an event", but would readily agree, if it were put to him, that he meant that it was the importance of the event which was exaggerated. B writes of "weather forecast to be sunny", but would admit that this is not the same as "sunny weather is forecast". C has "describes half the story", for "tells half the story" or "describes half the scene", while D writes "weather conditions begin"—the meaning of which is difficult to express exactly. In short, the writers have no regard for precision of thought or expression. Yet all four had had training in science, and A and B had done more scientific subjects than arts subjects in their School Certificate.

This disregard for exactness goes with ignorance of the structure of the sentence. A is the best of the four, although he does not use full stops. Only his second sentence is bad, and that is ungainly rather than incorrect. B's sentence beginning "How many times . . ." may be an example of bad punctuation rather than ignorance of sentence structure, but we must notice that he uses the exclamation

and question marks correctly. C has not the slightest idea of the sentence, and D is no better.

These last two failings are the English teacher's headache, for they are also behind many of the mistakes made by his more competent students. There is, however, an advantage in this: by tackling these faults in the work of his very weak students, the teacher should find ways of helping all his students.

Sometimes the English teacher can do nothing to help. There seem to be some people who are quite incapable of choosing words carefully, or understanding the structure of a sentence. These are, however, very few. Most of the really weak students will respond to patient and determined tuition.

What then can the English teacher do? Firstly, he can inculcate the habit of revision, of working over the passage time and time again. Insistence upon legible handwriting, very clear punctuation, and a neat arrangement of the work is a great help, for it ensures that the student makes at least one fair copy. A student who can type his exercises often makes a remarkable improvement. Students should also be encouraged to let some time elapse between writing their work and revising it; if a student's exercise is returned to him unmarked a few days later, he will often discover for himself some of the weaknesses in it.

The co-operation of other teachers is very desirable. Teachers of other subjects will sometimes mark a statement right when it is obvious that the student knows the right answer, although he has not expressed it clearly. These teachers should be persuaded to look very carefully at the work of students who are very weak in written English, and to mark wrong anything that is vague, or of which they have to guess the meaning.

The English teacher should also insist upon verbs. If one looks at the work of people who write really badly, one immediately notices how few verbs it contains apart from the verb "to be". The finite verbs are even fewer, and the finite verbs in the active voice fewer still; the writers wind themselves round with passive and impersonal constructions. It is no use insisting that students write short sentences unless one also insists that the sentences contain verbs in the active voice, and that the verb "to be" is not overworked.

The teacher's insistence upon short sentences will rescue the weak student from one of his worst enemies—the relative pronoun. The weak adult student is fascinated by relative pronouns, and he is forever mislaying the antecedents. Personal pronouns, too, cause many

errors. B's sentence about weather forecasts not doing "their" job is typical of the confusion that is very difficult to get rid of. The teacher will find that it pays to do a great deal of very simple sentence-construction work with relatives and personal pronouns.

Then there is the study of words. Oral and written practice in the use of selected words, particularly pairs of common words such as "skilled" and "skilful", "judicious" and "judicial" are useful. Best of all, however, is the very close study of passages of good and passages of bad writing. The students must be brought to see how the good writer, at any rate of factual prose, is always exact; how, compared with the bad writer, he uses more finite verbs, fewer adjectives, and far fewer participles and abstract nouns.

Lastly, the students must be drilled into condensing their work, for the work of weak students always contains far too many words and far too few ideas. It is a good idea sometimes to return an exercise unmarked, with the demand that the student shall re-submit it, unaltered, but accompanied by a précis of it which is not more than two-thirds of the length of the original and contains all the facts in the original. Most students will later see that they have improved their work by cutting it.

The above are hints designed to indicate the principles rather than to describe the methods which have been successfully used to improve the written English of certain adult students. One valuable piece of practical advice may, however, be given; that is for the English teacher to reserve his most severe censure for the student who, in reply to a criticism of a vague sentence, says, "Everyone knows what that means." It is the weak writer's last resource. He does not know what he means, and neither will anyone who reads his sentence.

H. W. Heckstall-Smith

POCKET ENCYCLOPÆDIA OR SKELETON KEY?

I WAS at Tonbridge School from 1910 to 1915. Throughout my first four years most of my lessons were called Latin, Greek, or mathematics.

I say "called" because both master and class felt free to do plenty of other things in Latin or Greek periods. There was never any hurry, and we could do our "proses", grammar, and translations thoroughly, and take a turn at English poetry, or philosophy, or economics, or anything that happened to turn up. I don't recollect having more than about six periods a week in all for subjects like history and French, and I doubt if we did any English or geography as such. "Art" (horrible word) was a distant thunder of lower forms in Big School, and I never had one single period of science, woodwork, or metalwork (though there were excellent laboratories and workshops).

In my last year all my class periods were mathematics, and I spent all the rest in the school library, an enormous place so totally disorganized that no one had the dimmest idea where any particular book was, unless he had accidentally come across it himself, or searched for it with enough determination to find it.

You could not say with confidence of any single shelf that it would be dull. In a modern, well-labelled library you start off sure that some shelves won't interest you—shelves labelled Classics, Philosophy, Poetry, or Physics, for example. So the library simply makes your view of the world even more sectional than it was before. At Tonbridge it was well worth while to look inside every book on every shelf, and in five years I did. I still remember the day when I hit on Samuel Butler's *Notebooks*. I turned over without hurry every page of every volume of *Punch* from Vol. I to 1914, till I could hardly find a volume I had forgotten enough to be able to read it again. In the evenings of my last year, when I was a mathematical specialist, my tutor, H. S. Vere-Hodge, went through most of the *Iliad* and the *Odyssey* with me, and introduced me to other great works of that standing, notably those of Milton and John Sebastian Bach. I got familiar with a very wide range of English poetry and came to know most of the Beethoven piano sonatas well—pianists and their friends

were free of the music-rooms. There was no hurry and no urgency. I felt free to think; and in my last year there were no formal lessons for me outside mathematics.

I never heard of the School Certificate or the Higher Certificate and took no external examination of any kind until I tried for a Cambridge entrance scholarship.

What now strikes me about my intellectual education at Tonbridge is that it had something right about it, something that is missing from the secondary-school curriculum that has been forced on all schools, whether independent or State-aided, for the last thirty years. I am not saying that to give me no science and no workshops was a positive virtue, or that libraries should be organized so that you can't find books easily; only that the Tonbridge set-up—it can hardly be called a system—did have a major virtue that has since been largely lost. I may summarize this virtue by saying that the school left me with a skeleton key for learning, instead of the pocket encyclopædia I would have been given thirty years later. What has struck me in the thirty-five years since I left school is that I have always been able, though all my teachers have agreed in classing my brains as competent but not outstanding, to learn complex and difficult subjects—particularly the technical subjects where wrong learning shows up most conspicuously—even when I had no hint whatever about them at school. I don't, by the way, defend my emotional education at Tonbridge. It was poor, and the lack of what I might have learnt emotionally at school has handicapped me ever since; but to blame Tonbridge for this would be unfair, for present-day public schools strike me as just the same in this respect. But it is intellectual education I am talking about, the ability to learn to understand, and I do not think the badness of my emotional education diminished the excellence of the rest. To have had the worse better would not have made the better worse, and I think you could have a school as sound as Tonbridge intellectually and much sounder emotionally.

I give three examples of the skeleton-key quality in my education:

1. In June 1920, aged twenty-four, I found myself, like many others after demobilization, with enough passes, allowing for my military service, to qualify me for a degree in 1922 provided that I stayed at Cambridge and did enough work to entitle me to "a certificate of diligent study".

This bit of luck justified me in having a direct shot at Part II Physics. Though it was not unusual for a man who had taken Part I

Mathematics to follow it with Part II Physics, it was exceedingly unusual for anyone to take it after having done no science whatever, even at school. I just started from scratch, with the confidence of being able to learn anything if I wanted to that I regard as a Tonbridge legacy, and got Class II Honours. In 1923 I was Senior Physics Master at a public school, never having done a single experiment in physics or any other science till 1920.

2. I never learnt any carpentry at all at Tonbridge. When I was about thirty I thought I would like to build a 14-ft. dinghy to a professional design, and in several years of spare time (not counting school holidays) I did so successfully, learning to manage wood and tools as I went along. I sailed the boat, sleeping on her in summer, for several years quite successfully.

3. At the age of forty-three I started farming with no previous knowledge of farming, gardening, chemistry, or biology.

I had just enough money to buy a hill-farm, and I bought it. I was 100 per cent. a farmer from the start, not a half-timer or "gentleman". I did not hire a skilled ploughman. I became one by spending the first year contract-ploughing for my neighbours. I produced sheep, milk, poultry, seed grain and seed potatoes. My grain and potatoes obtained the seed certificates in the first year I grew them. My flock of poultry was Accredited in two years, my cows T.T. Attested in three. I was soon on the Technical Committee of the County, and on lots of other technical committees. I did not become that rare bird, a highly skilled farmer, but I did show that an uninhibited person of normal intelligence, reasonably well able to get on with other people, can quickly learn enough farming technique to hold his head up with his neighbours.

I think the idea that farming technique can only be learnt by those bred to it is just a hoodoo. It is the sort of hoodoo that a pocket encyclopædia education leads people to accept.

How does modern education encourage this hoodoo, and how did Tonbridge leave me clear of it? What is the difference between education that leaves one with a skeleton key and education that doesn't?

I have long felt by instinct, with intense certainty but no clear grasp of the reason for that certainty, that *education which allows you to do something—anything—thoroughly, with practically unlimited time for reflection, gestation, and chewing the cud, is education that gives you a skeleton key*. Only this year have I hit on at least a hint of a definite explanation, in the following passage from Theodor Reik in *Listening with the*

Third Ear, p. 350: "Children evince an unwearying impulse to repeat the same impression unchanged—for instance, to hear the same fairy tale with the same words again and again—and they do not want at first to have a reminiscence of their impressions, but to *master* them." (My italics.)

This is the solution—*Mastering* impressions is what we need, and it is precisely what the School Certificate, pocket encyclopædia business prevents. Instead, it forces on us the necessity of getting together just enough superficial knowledge to scrape past in subject after subject. Again, Reik writes, "A child is curious, desirous to see and know new things, *novarum rerum cupidus*. A very feeble ego confronts this receptivity, and, incapable of mastering so many new impressions, *it is forced to hand over the greater part to the unconscious for later assimilation*." (This was what I think of as "chewing the cud".)

"The infantile mind works like a coarse sieve, letting through a number of impressions in order to re-examine and despatch them later. As the ego grows stronger, it is better able to stand up to its impressions. *It restricts the field of its attention*, and, by distinguishing between what is important and what is immaterial, . . . it can apply greater mental energy to the mastery of fewer experiences."

This passage does explain to me where Tonbridge helped me, and where the secondary schools of the last thirty years would have hindered me. They make reflection impossible. There is never time to chew the cud. No wonder most people need to be continually "amused" or "entertained" by things that pass the time, and cannot enjoy themselves with things that take a long time and great mental energy. I think my rather sudden move from the headmastership of a large secondary school, where I liked the children very much and was not bad at the job, was partly due to the feeling that the school work was the wrong sort, but that for the time being I could do nothing much about it; whereas farming has to be done properly because the fact is unmistakable if it is done badly. Let us look over the shoulder of a Headmaster assembling (that's the word) the time-table of a Grammar School—30 periods of 45 minutes each in a 5-day week to cover Everything. 2 for Games, of course, 2 for Physical Education; 1 for Religious Instruction ("R.I.", "Take it myself; meet the whole school in class every year at the cost of only 1 period a week, unprepared, for one term with each form"); that leaves 25 for Matriculation work, 5 for English, 5 for French, 5 for Latin, 5 for Maths, 4 for Physics, 4 for Chemistry, 4 for Biology, 2 for History, 2 for Geography, 2 for "Art", 2 for Woodwork or Domestic

Science or Gardening, 1 for Civics or Something Progressive. 41 into 25 won't go; so here we must leave him, for it never does go.

Whatever you think about this scheme, there is no doubt at all that it is quite different from the 1910-15 scheme at Tonbridge.

Note first that the Tonbridge scheme was the result of unplanned growth for several hundred years at least, whereas we can now see the school certificate curriculum as unplanned panic.

Look for a moment at the time-scale of the human race. It is a thousand million years since the first life, 100 million since the first mammal, one million since the first man, 10,000 since the first civilization, 2,000 since the Christian era began, 500 since printing, rather more than 100 since the scientific revolution, and only 80 since compulsory education for all. The curriculum I complain of is a hopeless and panic-stricken attempt to stand up to a vast explosion of knowledge of which we have only just seen the very beginning.

To keep up with it is quite hopeless. The attempt is doomed already. Unless man destroys himself he may, the astrophysicists tell us, have a thousand million years of life ahead. He has had one million now when the dinosaurs had 100 million and other species far more. As a species he is an infant in the pram, and his first good look out of the pram has shown the futility of the pocket encyclopædia scheme of learning, though not, I think, the traditional scheme out of which Tonbridge grew.

So man's only possibility now is the skeleton key, and he must throw away the pocket encyclopædia. I am not imploring educational authorities to do this. I am pointing out that circumstances will force them to do it willy-nilly, and that therefore they had better address their minds to the problem and make the change in an orderly manner, rather than tumble into it unwillingly and unthinkingly.

What had they better aim to do? I am clear enough about the answer to this question to try to communicate it. For shortness, I must put my answer dogmatically, but I know it represents a point of view, not a statement of fact.

You need three quite different kinds of subject at school. These are (A) the skeleton key subject or group of subjects, the part you do with all the thoroughness and concentration in your power; (B) the knowledge of certain facts and techniques that every citizen of a modern state must have a grip of if he is not to be an infernal nuisance; (C) the particular kinds of knowledge and skill, peculiar to himself or herself, that each individual needs *qua* individual.

Three radically different methods are needed for these three kinds of learning. Let us look at them briefly.

Class-A, or Skeleton key, Subjects

I have tried already to explain the purpose of these on page 174, but they seem to me so overpoweringly important that I must put my explanation again in different words. A skeleton-key education is one which gives you a chance to learn something properly to the limits of your power, so that you can get a feeling of continuity in your mind, and sense the difference between solid understanding and a façade in others as well as in yourself; then, whatever turns up later on that you want to learn, you will be able to seize it with avidity as, after being at Tonbridge, I was able to seize physics, boat-building and farming.

Class-A subjects at school need to be a rather grim all-out effort. They are what you put your whole mind to, and you no more need to be entertained than the driver of the Royal Scot needs the Light Programme while on duty.

Class-B, or Public Utility, Subjects

Class-B subjects cover a pretty wide range. Among them are first-aid, hygiene, food-values, elements of the physiology and psychology of sex, politics in Britain and the world, the principles of the Law and Local Government and their day-to-day practice; indeed anything you would be annoyed with a man-in-the-street for not knowing in an emergency touching you personally.

Class-C, or Individual Enterprise, Subjects

Class-C we need not go into in detail, for it concerns personal tastes and pleasures. Formal lessons are not needed, but time and apparatus must be available. Whatever your special branch of learning, you must be able to learn and practise whatever you reasonably choose, whether it is painting, dancing, journalistic writing, metalwork, or making wireless sets. Only by letting the personal tastes of individuals develop freely can any community find out new truths and acquire new powers. It is not just fun and pastime. It is the way in which the human race has emerged, or partially emerged, from barbarism.

Note that while deliberate entertainment would be lunatic for Class-A and Class-C subjects, you can have as much as you like for Class-B. There is not the slightest need to have all the Class-B

subjects done at once. They can be spread out over 15 terms in any order, so long as each member of the school does, in the course of his school career, go right round the merry-go-round once.

Instead of the present method of trying to do the impossible and make everyone work hard and understand everything thoroughly in classes of thirty, we should try to entertain them in groups of 100-plus for Class-B subjects, or free them for Class-C activities, for an appropriate proportion of the school week so that, even with the present staffing-ratio, all Class-A subjects may be studied in classes of 15 at most—the largest class in which a good teacher can keep up with everyone's mistakes and really get them understood.

Luckily the New Certificate supersedes the School Certificate in 1951, for the Ministry, with silent heroism, has defended the New Certificate successfully against the assaults of headmasters. It is going to be a big help in letting us learn how to learn, for it will allow candidates to choose which subjects to do thoroughly, limiting their range to suit their capacity. University candidates will still have to do enough subjects to satisfy their university, but that necessity will no longer confuse the school work of the majority; and, if the majority are rescued from the panic of the last thirty years, the school may come to have what Tonbridge had for me, the air of a place where things are done properly, however long they may take.

In sum, secondary schools of the future should have three kinds of study. In Class-A subjects they should have plenty of time to do a few subjects in classes of not more than fifteen with the greatest thoroughness they are capable of, and no adventitious aids. Class-B subjects should be taught in very large groups with all the resources of the entertainment industry, particularly films, demonstrations, visits and excursions. It should be a combined see-the-world and don't-be-a-mug course. Class-C subjects should be done as projects, individually, with adequate apparatus and adequate advice and guidance.

But what is to happen to the present adult population, nearly all of whom (if I am right) have been educated in a muddle-headed, superficial, and thoroughly discouraging way?

The only cure seems to me that they should, even now at so late an hour, try to learn something thoroughly; and, for the great majority who cannot go to a university, some form of further education, part-time education after leaving school, gives the only way to do this. Evening classes, W.E.A. classes, University Extra-murals, have one

thing in common; you can choose your subject and do it for as many years as you like.

If you know that your mind has been bedevilled by the smatterings of schools in the worst era of the School Certificate, you can do something to break the spell if only you can be completely determined, in just one subject, never to hurry, never to let past anything you don't really understand, to care nothing for time or results or efficiency or any other works of the devil, who always was the Patron Saint of efficiency. If you can learn to reflect and reflect and reflect, to wait and wait and wait until you are really conscious of illumination in just one realm of ideas, however narrow, you will have a foot in the enchanted country of Roger Bacon and Spinoza, of Lyall and Darwin, of Faraday and Clerk Maxwell, of every man who has really distinguished his race from other living creatures who cannot reflect, originate, or worship.

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ADULT EDUCATION IN CANADA. *Canadian Association for Adult Education.*

In the early 'thirties I spent a year at the College of Education at the University of Toronto. There I heard a great deal about intelligence tests, the neurological foundations of behaviour, the learning curve, and so on; there, too, my brain grew more than somewhat fatigued trying to follow the statistics of a series of experiments which appeared to prove that it was almost impossible for the brain to feel the effects of fatigue in any ordinary intellectual occupation. So it went on—lectures, seminars, a great deal of reading, and a fair amount of talk about education—but not a whisper do I remember hearing about any branch of adult education except the university extension courses. Now, with the help of the Carnegie Corporation, the Canadian Association for Adult Education has produced its first printed report, and I am appalled to think how much was going on at the time without my hearing anything about it. That broad stream has since become a flood; and yet according to this report, only last year a Canadian business man, vice-president of a large industry, was astonished to hear a speaker in a convention in New York say that the most arresting developments in adult education the world over were taking place in Canada. The vice-president had never heard anything about adult education in Canada at all.

What—apart from wide open spaces—has Canada got that we have not? It has in its adult education a remarkable variety of methods and organizations, and it has produced men and women who have brought a freshness to education which we sometimes appear to have lost.

As early as 1891 a meeting was held to discuss the formation of an Association for the Extension of University Teaching. The "womb-to-tomb" notion of education is now enshrined in the statute book and is often regarded as a post-war phenomenon; but during the Victorian sunset, at the beginning of what were to be called the "Naughty 'Nineties", a certain John Cox of McGill was declaring: "University extension has not only three or four years of a man's life in view but this, that education ends only with life itself. . . . Its aim is not to teach a man the whole of a subject but rather to stir him with a desire to study the subject himself."

There is something very fascinating about the glimpses we get in this report of the "horse-and-buggy" days of adult education. In 1912 the President of the new provincial University of Alberta

offered a promising young man, A. E. Ottewell, a position as director of a projected extension department.

From that time on until 1928 Mr. Ottewell was known from the Peace River country to the Montana border as a sort of one-ring educational circus. He had everything but a performing seal. Now that we are becoming sophisticated about adult education—in danger, in fact, of trying to turn it into an exact and measurable science—it may be worth while to go back twenty-five years to the days when adult education had no name and no social standing, and watch this pioneer at work in a pioneer province. Mr. Ottewell carried in his battered Ford car the first moving pictures that thousands of Alberta children and grown-ups had ever seen. He had a "magic lantern" and boxes of slides. He had books and pamphlets, and in his head and heart he had a great understanding of the economic and domestic problems of life on a prairie farm. His procedure was simple but basic in its appeal, and very effective. When his audience had gathered in the school or the community hall, he started them off with a roaring sing-song, which might last half an hour if the roof stayed in place. After that came an hour and a half of moving pictures, ground out on a 28mm. machine equipped with a 12-volt battery and a hand-crank. Later, when the children were safely stowed away for the night—those small enough, in apple boxes—the "Director" got out his projector and slides and lectured on almost any subject desired, from the Darwinian theory to "How to Winter Fall Pigs". His success did not depend so much on his remarkable platform ability as it did on a capacity for understanding and liking people. Sitting up half the night in a homesteader's shack just listening while he told what was on his mind was often more important than any number of lectures.

Frontier College is another institution peculiar to Canada. This organization, during its fifty years' existence, has taught simple English to 70,000 men, brought informal discussion classes to quarter of a million and has made available to lumber and mining camps over four million magazines and books. The teachers in the Frontier College are undergraduates whose main income comes from labouring jobs during the day. Two winters ago one of the Frontier College instructors taught basic English to Latvian miners in the Yukon. Some of the pupils snowshoed from neighbouring camps thrice weekly to attend classes, a three hour journey—and the temperature 55° below zero!

Radio plays a much more direct part in Canadian adult education than it does in this country. The National Farm Radio Forum began in 1941. During 1948-9 1,588 Farm Forum groups met regularly. Here is a description from the Report:

A Farm Forum Meeting

The yard was lit up by the high beacon-light between house and barn as we drove up the lane. Lights shone from the windows of the big farm-house and two or three cars were parked in the yard. Snow was falling and threatened to make driving difficult on the way home.

"Oh well, there's a shovel and some old sacks in the back," said John Bennett. "I guess we'll manage all right."

"If we get stuck there'll be lots of others to keep us company," laughed Mrs. Bennett.

Cheery hallos greeted us as we entered the big kitchen where several people were sitting round chatting.

Men and women (some accompanied by small children) continued to come until the kitchen was crowded. But everybody stayed there because that's where the radio was.

Finally the host of the evening said, "Well, I guess it's time for the broadcast." As he turned on the radio, the chatter died away. "This is National Farm Radio Forum," said the announcer. Then we heard the familiar theme song, "Men of the Soil".

The broadcast was a dramatized one on the subject, "Is Farm Income Used Efficiently?" Chuckles were heard and glances were exchanged with nodding of the heads as the farmer and his wife in the radio drama argued whether they should spend precious money on plumbing for the house or a new tractor. In twenty-five minutes the dramatization was over and a new voice—that of the Provincial Farm Forum Secretary—was heard reporting the findings of the previous week's group discussions.

Then the radio was turned off, and the chatter started up again. But not for long. The Chairman of the group stood up.

"Ladies and gentlemen," he said. "There are nineteen of us here to-night so I guess we'll have two groups. I'll number you one-two, one-two, and the one's can go into the living-room. The two's can stay here. Each group will appoint its own chairman and secretary as usual."

Pretty soon the two groups were sitting in a circle each in its own room, and they quickly appointed a chairman to lead the discussion, and a secretary to take notes. Everyone pulled out his copy of "Farm Forum Guide" and turned to the inside page where the discussion questions were listed. The broadcast had started people thinking and they launched right into the discussion in a lively but good-natured fashion. It was hard to get them to stop discussing one question and start on the next.

In about an hour's time the two groups came together again and the Forum Chairman called for reports on the discussion. On two of the questions there was general agreement but on the third they could not agree. They argued about it for a while and finally agreed to disagree.

Then followed a brief business meeting after which the recreation leader got everyone playing games until "lunch" was served. The Forum Secre-

tary, however, busied herself writing up the "Forum Findings" to send to the Provincial Farm Forum Office.

At 11.30 the meeting was over and by midnight the last friendly neighbour had driven his car down the lane and into the snowy night.

These programmes are sponsored jointly by three nation-wide, non-profit and non-political organizations: the Canadian Association for Adult Education, the Canadian Federation of Agriculture and the Canadian Broadcasting Corporation.

These glimpses of adult education in Canada give some indication of the enterprise that Canadians have shown in this direction. There are other special Canadian developments—community film councils, the highly individual development of the Extension Department of St. Francis Xavier University, the Parent Education Service of Nova Scotia, and the Folk Schools of Manitoba, for example. Interesting details of these are given in the report, and the whole builds up into a picture that for all its formality of presentation is both fresh and stimulating.

H. D.

PRIMITIVE LAW. By A. S. Diamond, M.A., LL.D. *Watts & Co.*, 15*s*.

On June 22nd an exasperated M.P. wrote to *The Times* in scornful complaint about Clause 34 of the Finance Bill, whose pompous and costive prose he quoted at full length. It was not a specially heinous example of legislator's jargon. You could understand it—I could understand it—on a second reading. But he likened it to the lawsuit before Pantagruel, in which Lord Kissebreech sued Lord Suckfist on a dispute "so high and difficult in Law that the Court of Parliament could make nothing of it". Pantagruel, said the angry M.P., gravely heard plaintiff and defendant, "each of whom made a long unintelligible speech which Pantagruel pretended to understand. He then gravely uttered some paragraphs of similar nonsense, after which he proceeded to give judgment". Had the time not come, concluded the letter, when the legal profession might—even in its own interests—tidy up legal language? Or must we wait for another Rabelais?

No Rabelais could help us to-day. He would be in and out of Pentonville on Common Law indictments more flatulent than any he could have imagined. We must look to Sir Ernest Gowers, Sir Alan Herbert, Mr. Ivor Brown, and others to expose with the sweet winds of scorn the literature that tells us what we must do to avoid fines and imprisonments. Acts of Parliament are so worded, we are told, as to prevent needless litigation on shades of meaning. The extent to which they fail in this can be measured by the footnotes in the text-books, where masses of judicial interpretations inhibit confident reading. But sometimes a clause will stand for years

before anyone risks his money on an invitation to the High Court to say what it means. Take, for example, Section 17 of the Road Traffic Act, 1930, whose object is to say how many attendants there must be on trailers drawn by traction engines:

"... Two persons shall be employed in driving or attending the locomotive whilst being driven on any highway, and where any such locomotive is drawing a trailer or trailers on a highway one or more persons, in addition to the persons employed as aforesaid, shall be employed for the purpose of attending to the trailer or trailers at the rate of one such additional person for each trailer in excess of one."

No one knows what this means (though it is charitably assumed that "whilst being driven on any highway" relates to the locomotive and not to the "two persons"). Some day the High Court will have the opportunity to decide whether a locomotive with one trailer needs three people to comply with the law. I don't think it does, but the contrary argument is daunting. Nothing could be easier than to say that every trailer must carry an attendant, but this would not propitiate the great god, Jargon.

The late Sir Harry Maine's monumental work, *Ancient Law*, purported to trace the legislator's "characteristic love of technicalities and formalism" to religious origins. In *Primitive Law*, Dr. A. S. Diamond shows clearly that the rules of primitive law cannot be considered as either originating in or developing under the impulse of religion. "When such rules of law have evolved, they may and do later receive in some cases additional support and stability from taboos and other sanctions of religion and magic"; but the belief in magic and religion has not been a parent of moral ideas—its influence has been of a conservative and stabilizing nature, resisting change and strengthening the moral ideas once they have evolved.

It is of course a rationalist's view; but it could have a salutary effect on the legislature. What Dr. Diamond calls the conservative and stabilizing influence of religion on law has, as it were, petrified it in the form once created by the appetite for mysticism ("know all men by these presents ..."). The passion for repetitive verbiage has not, despite the supposed intention of the law-makers, "prevented needless litigation on shades of meaning": it has promoted it. Only this year the Probate Court was faced with the problem whether a will was sufficiently attested with the words "signed by the testatrix in our presence and attested by us in the presence of her and of each other"; the Wills Act, 1837, requires that the witnesses shall "attest *and subscribe*". Both words mean the same thing, said Mr. Justice Hodson; "the word *subscribe* in the section is otiose".

Otiose, indeed, is the word for huge areas of English law. We could do worse than go back to the simple, conditional sentences in the third person ("If a man does so and so ...") that distinguished the laws of Ethelbert, King of Kent in 597. These, as Dr. Diamond says, were "rules

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of true law with purely secular sanctions". It might be hurtful to enquire whether the 1950 Finance Bill is of mystical inspiration, but its sanctions will be secular enough.

C. H. ROLPH.

JOINT CONSULTATION OVER THIRTY YEARS. By Sir Charles Renold. *Allen & Unwin, 18s.*

It is often assumed that Joint Consultation is a new weapon in the battle for greater production. So it is in many firms, but in some corners of industry it has been more than just an idea for some time. The Renold & Coventry Chain Co. Ltd., is one firm in which Joint Consultation has been on the go long enough to be regarded now as an established tradition in the company's various works. So anyone who is inclined to dismiss Joint Consultation as a new-fangled idea or a temporary craze should be invited to read this book. Issued with the blessing of the British Institute of Management, it gives a detailed description of how methods of Joint Consultation evolved in the firm and of the part this technique has played not only in day-to-day business but during various crises.

One has only to read the account of how the various committees acted when it was decided to move the Wheel Department of the Renold Works, Manchester to premises in Cardiff to realize that a detailed study like this is by far the most useful way of disseminating knowledge about Joint Consultation. Generalities would be useless. Here we have copious extracts from the minute-books of the various meetings, and we are able to follow in considerable detail the discussions which the various problems involved in the transfer of a complete department to so great a distance—alternative employment, redundancy, compensation, leaving bonuses.

In five short sections at the end of the book, Sir Charles states what he regards as the general principles of successful Joint Consultation. Briefly these are: (1) Managements should regard facilities for Joint Consultation not as concessions but as opportunities for management and employees to see each other's point of view. (2) Consultation is necessary between every level of management and the workers with which each level is in contact. (3) Formal procedure at meetings is important. (4) Discussion should be encouraged on things that really matter and not limited merely to minor grievances. (5) The Personnel Officer should be able to take a detached view and should not be merely a representative of the management.

Appendices and charts add weight to a text which really does give insight into the handling of managerial problems. There is only one thing missing: the minutes of the meeting of Joint Consultative Committee at which the manuscript of this book was discussed. Probably no meeting of the kind took place; but our knowledge of Joint Consultation will not be complete until a book is published which has been subjected to that treatment.

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Ourselves and the Community, by E. E. Reynolds (Cambridge University Press, 6*s.* 6*d.*), which was first published in 1932, has been rewritten. Not only has it been brought up to date, but it has also been put into a form rather more suitable for adult classes than the earlier editions and is a good and not too heavily detailed account of the evolution and working of the machinery of national and local government in this country with brief notes on the other nations in the Commonwealth.

Elementary Building Craft Geometry and its companion volume at the advanced level (Macmillan, 5*s.* and 5*s.* 6*d.*), by H. S. Emery, are useful texts for City and Guild examinations in building. The elementary volume assumes little previous knowledge. Examination papers included in the advanced volume give the student a clear idea of what he is working towards.

Sixth Form Citizens, an enquiry by the Schools' Committee of the Association for Education in Citizenship (Oxford, 10*s.* 6*d.*), is not only of use to grammar school masters, but of immediate significance to those who are trying to "liberalize" the technical colleges.

Estimating and Planning for Engineering Production, by P. S. Houghton (Blackie, 25*s.*), is a thorough text-book on this subject. A large number of reference tables dealing with materials and various operations are incorporated in the text. But the criticism must be made that the English of the text is both clumsy and uneconomical.

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It would seem on the face of it that no man is better qualified to interpret a poem in reading than the man who composed it, and yet we do not hear of Shakespeare in the part of King Lear or Hamlet. Under the auspices of the British Council, H.M.V. have recorded a selection of poems by Stephen Spender read by the author (three records, C3987-3989). Excellent though these records are technically, one must confess to a feeling of disappointment. The reading is rather flatly monotonous and no recording apparatus is ever kind to overstressed sibilants. It is good that these records should have been made, but it is doubtful if they are of a kind which one could recommend to teachers of literature classes. They do not stand up well to comparison with Stephen Murray's reading of Wordsworth or some of the other poetry recordings previously noted in this journal.

For the music appreciation class there could hardly be a better introduction to Sibelius than his *Symphony No. 6 in D. Minor, Op. 104*, not only because it says much in small compass, but also because of its brilliant immediacy. It is the kind of piece which now and then surprises a young listener into liking what for him may be a new world of music. Sir Thomas Beecham conducts the Royal Philharmonic Orchestra in a vigorous and yet discriminate recording (DB6640-2).

A sharp contrast is provided by two of the new vocal recordings. On H.M.V. C3983 Margaret Ritchie records two lovely eighteenth-century songs, Boyce's "Tell me, Lonely Shepherd" and Bishop's "Bid me Discourse." In spite of the grottoes, the *Dunciad* and an urbanized culture there are some things about the eighteenth century that still seem as fresh as is the month of May. Among them are those two songs. Margaret Ritchie, with Gerald Moore accompanying, brings out that freshness in full measure. "*Gestillte Sehnsucht*" (Rückert-Brahms), sung by Kirsten Flagstad, accompanied by Gerald Moore and Herbert Downes (viola), is an impressive work (DA1922).

It would be invidious to select for special mention any of the recordings which the British Council have made for their anthology of English Church music and recently issued by Columbia. This is one of the best pieces of work the British Council have done. It may be that an anthology of this kind is a better anthology for being done from beginning to end by the same interpreters, but it cannot be denied that the music gains an additional interest from the fact that we have here an anthology of choirs as well. The fact, too, that we know the recordings were made in various cathedrals somehow prepares the mood in which the pieces can best be enjoyed—provides, that is, the imaginative framework for appreciation rather than criticism.

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